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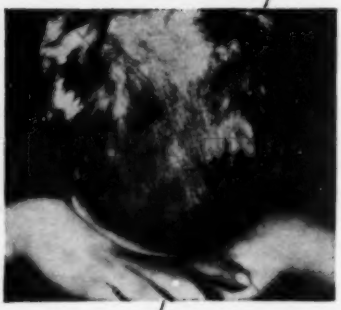
more effective against



tinea capitis

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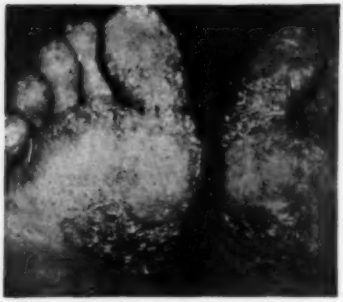

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1. Strittier, C.; Fishman, I. M., and Laurens, S.: *Transactions New York Acad. Sc., 13*:31, Nov., 1950.

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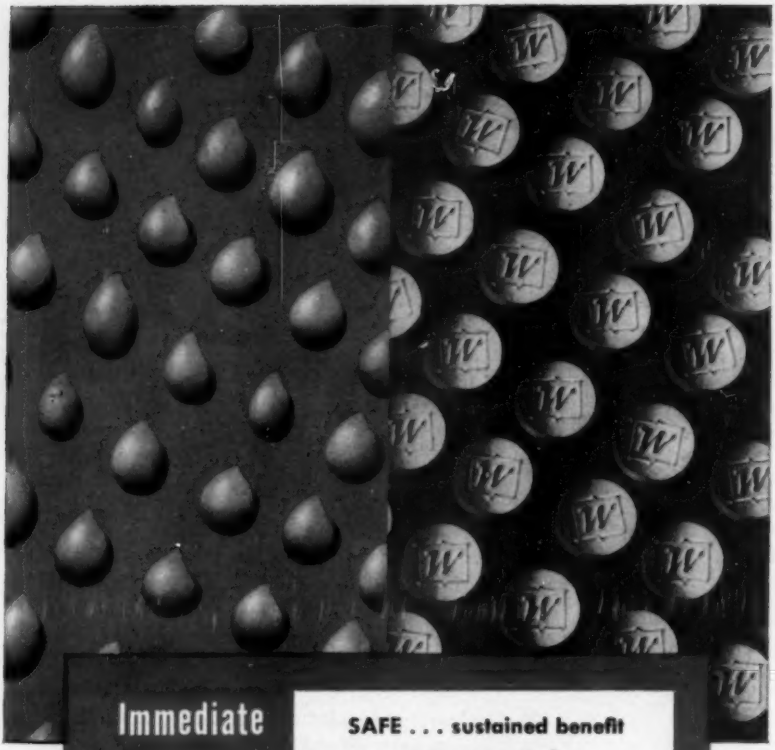

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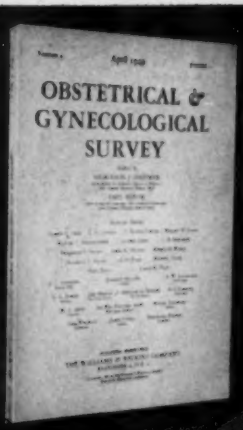

"... these statistics are the best that have been reported. In fact, they couldn't be any better."

Editor: Obstetrical & Gynecological Survey
Vol. 4, No. 2: April, 1949: page 190

The statistics referred to are those reported by Dr. O. W. Smith in her article, "Diethylstilbestrol in the Prevention and Treatment of Complications of Pregnancy", in the November, 1948, issue of *The American Journal of Obstetrics and Gynecology*. This study of 632 pregnancies showed that, "under stilbestrol treatment the habitual aborter enjoys the same outlook for a living baby as does the average gravida. This is what I mean by saying that these statistics are the best that have been reported".[1]

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REFERENCES
1. Editor: Obs. and Gyn. Survey. 56. 821-834. Nov. 1948. 2. Karnaky, K. J. Estrogenic Tolerance in Pregnant Women. Amer. Jr. Obs. and Gyn. 53. 312-316. 1947. 3. Silbernagel, W. M. and Burt, O. P. Ohio State Med. Jr. 39. 430 May 1943. 4. Rosenblum and Melinkoff. Preservation of the Threatened Pregnancy with Particular Reference to the Use of Diethylstilbestrol. West. Jr. Surg. Obs. and Gyn. 56. 597-603. Nov. 1947. 5. Hamblen, E. C. Endocrinology of Woman. Springfield, Ill. Charles E. Thomas, 1948. p. 476.

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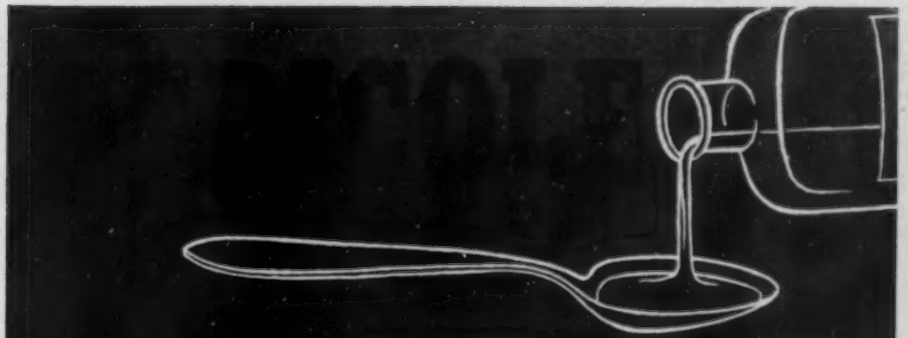
1. Anspaugh, R. D.: Effects of Dexedrine Sulfate on Nausea and Vomiting of Pregnancy, Am. J. Obst. & Gynec. 60:888 (Oct.) 1950.



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(1) Varco, R. L.: Surgery, 19:304 (March) 1946 "... the fatty liver ... is unquestionably of great prognostic significance." (2) Philpott, N. W., et al.: Am. J. Obst. & Gynec., 57:125 (Jan.) 1949. (3) Editorial: Ann. Int. Med., 22:615 (April) 1945. (4) Best, C. H., Mac Lean, D. L., and Ridout, J. H.: J. Physiol., 83:275 (Feb. 9) 1935. (5) Cohnheim, J.: The New Sydenham Society London (1889).

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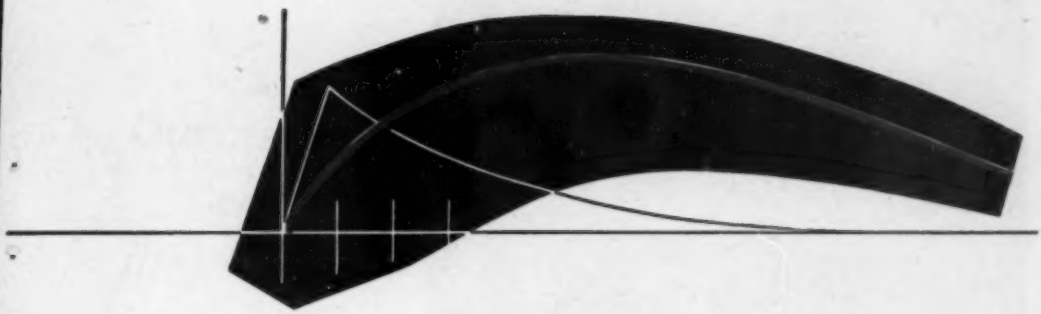

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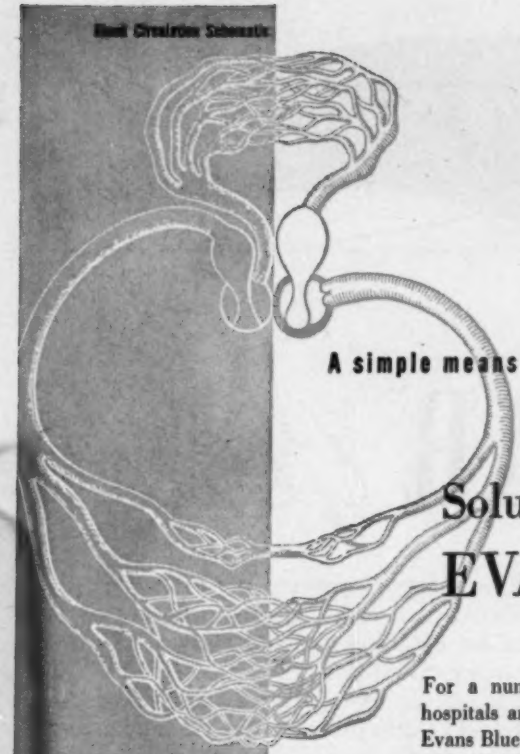

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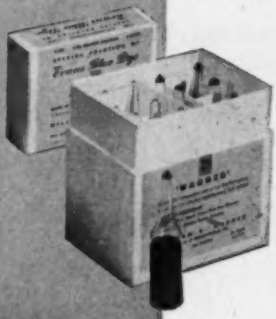

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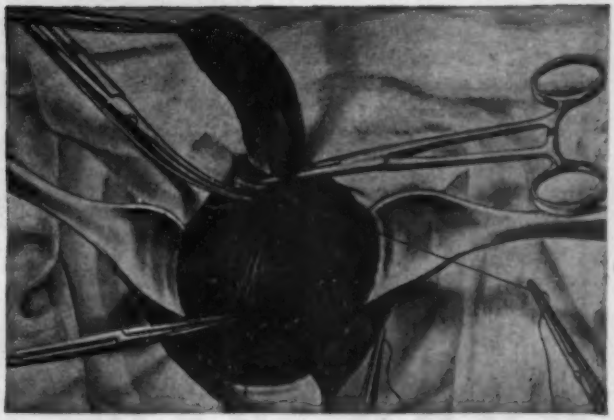

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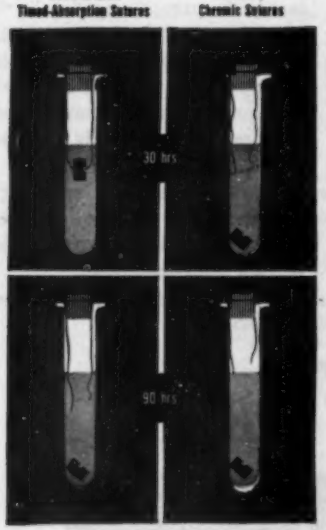

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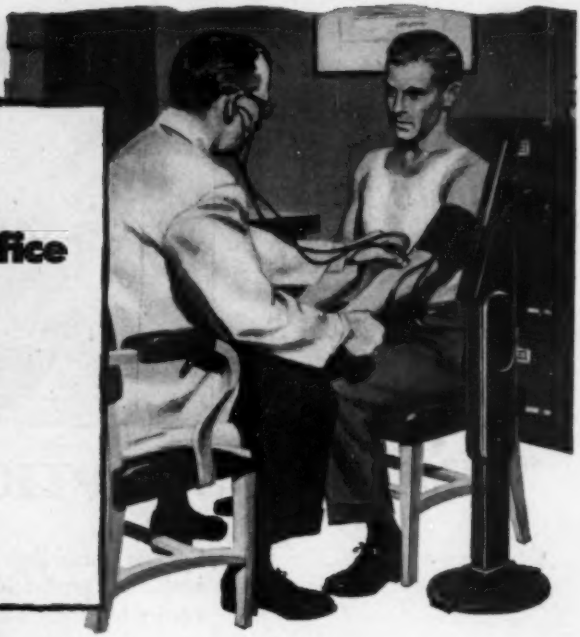

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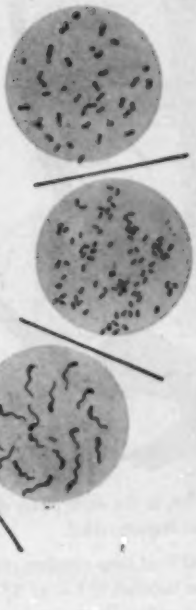

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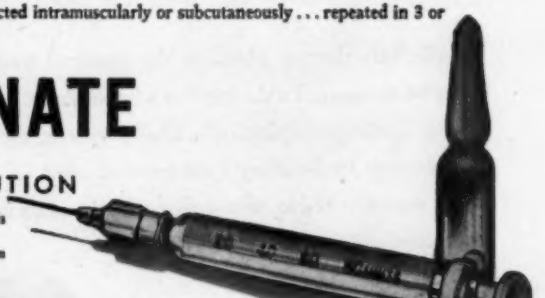

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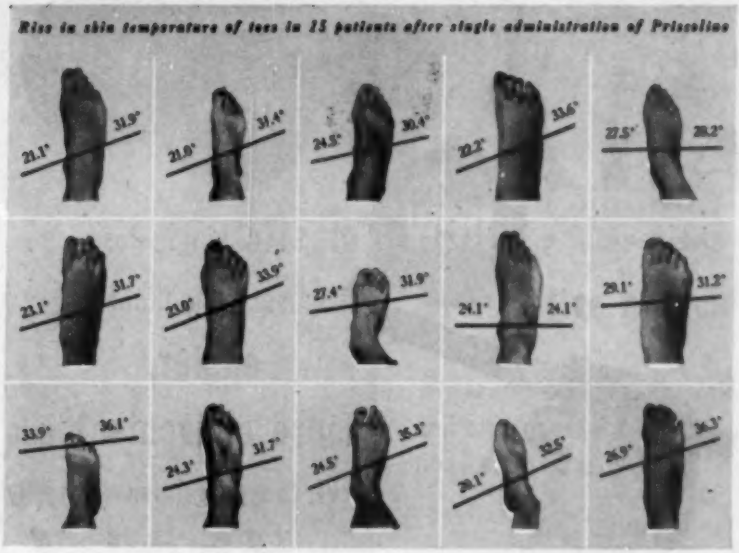

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1. Rendy, W. J.: J. of Lab. & Clin. Med. 37:305 (March) 1951.

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Formula: 0.2% gentian violet in a special acid-buffered water-soluble polyethylene glycol base. Non-toxic, relatively non-irritant.

samples and literature on request ●

WESTWOOD PHARMACEUTICALS

Division of Foster-Milburn Co.

468 Dewitt Street, Buffalo 13, N. Y.

1. Waters, E. G., and Wager, H. P.: Amer. J. Obstet. & Gyn. 60:885, 1950.

continuously acceptable

acts like milk

available in 3 forms

your patient will not tire of taking...

TRALAC

TRADEMARK

[GLYCINE AND CALCIUM CARBONATE]

an effective antacid

TITRALAC's "just right" mint flavor and smooth texture ensure continuous acceptance.

TITRALAC's precise proportions of glycine and calcium carbonate provide a buffering action singularly like that of whole milk.

No systemic alkalosis or acid rebound... free from acid-generating sugars. Especially useful in milk-sensitive patients or where weight gain is undesirable.

TITRALAC* Tablets..... Boxes of 40, bottles of 100 and 1000
TITRALAC Powder..... Jars of 4 oz.
TITRALAC Liquid.. Bottles of 8 fl. oz.

*Trademark of Schenley Laboratories, Inc.
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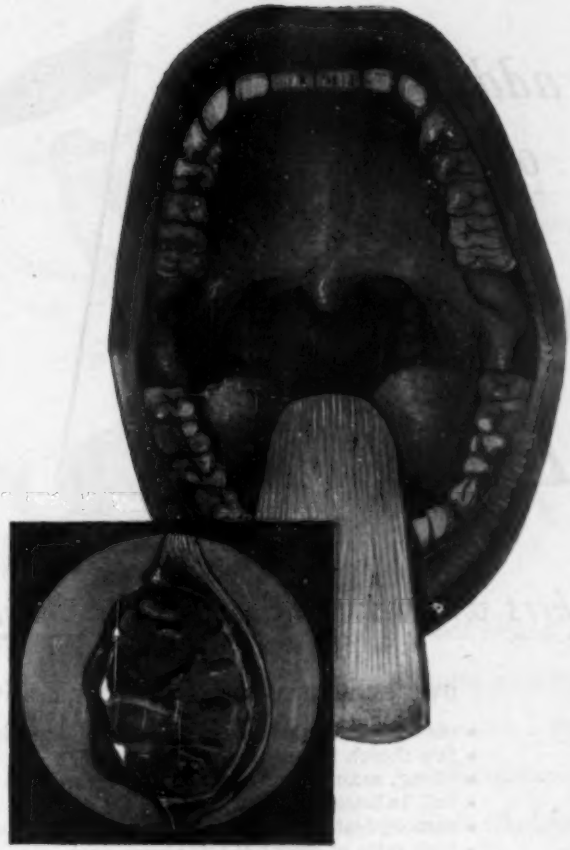
LAWRENCEBURG, INDIANA



in acute tonsillitis: "Excellent" responses, typical of the results obtained in a wide range of respiratory infections, Terramycin-treated, were noted in acute tonsillitis cases "within 48 to 72 hours, with rapid subsidence of temperature and physical findings."

Sayer, R. J.; Michel, J.; Moll, F. C., and Kirby, W. M. M.: Am. J. M. Sc. 221:256 (March) 1951

CRYSTALLINE TERRAMYCIN HYDROCHLORIDE

available | *Capsules, Elixir, Oral Drops, Intravenous, Ophthalmic Ointment, Ophthalmic Solution.*

ANTIBIOTIC DIVISION **Pfizer** CHAS. PFIZER & CO., INC., *Brooklyn 6, New York*

an added note
*of convenience**

SIMILAC

Liquid

for those mothers who seek the utmost in convenience

over and above these nutritional advantages:

- curd tension of zero, fostering ease of digestion
- fats chosen for maximum retention
- 50 mg. ascorbic acid per quart of formula
- full, balanced array of essential amino acids
- carbohydrate in the form of lactose (as in breast milk)
- high ratio of essential fatty acids
- minerals and vitamins in optimum proportions

**convenient to prescribe:*
the doctor need only specify the proportion of water—SIMILAC Liquid diluted 1 to 1 provides normal 20 cal./oz. feeding formula

**convenient to prepare:*
the mother simply mixes SIMILAC Liquid with the prescribed amount of previously boiled water and prepares "bottles without bother"

A QUARTER-CENTURY OF PROGRESS IN INFANT NUTRITION

M & R LABORATORIES • *Columbus 16, Ohio*

Management of pyogenic skin disorders...

'POLYSPORIN'® brand

Polymyxin B – Bacitracin OINTMENT

bactericidal to **BOTH** *gram-positive and gram-negative organisms, no local tissue damage, little likelihood of sensitization.*

Tubes of 15 Gm. (with blunt nozzle) ⅛ oz. (with ophthalmic nozzle)

For eliminating a very wide range of local infections.
For preventing contamination of burns, wounds, and skin grafts; such protection shortens healing time and reduces incidence of fever and local inflammation.[1]

1. Jackson, P. M., Lowbury, E. J. L., and Topley, E.: Lancet, 261:137, 1951.

Each gram of 'POLYSPORIN' OINTMENT contains:

'AEROSPORIN'® brand Polymyxin B (Sulfate) 10,000 Units (Equivalent to 1 mg. Polymyxin Standard)
BACITRACIN 500 Units

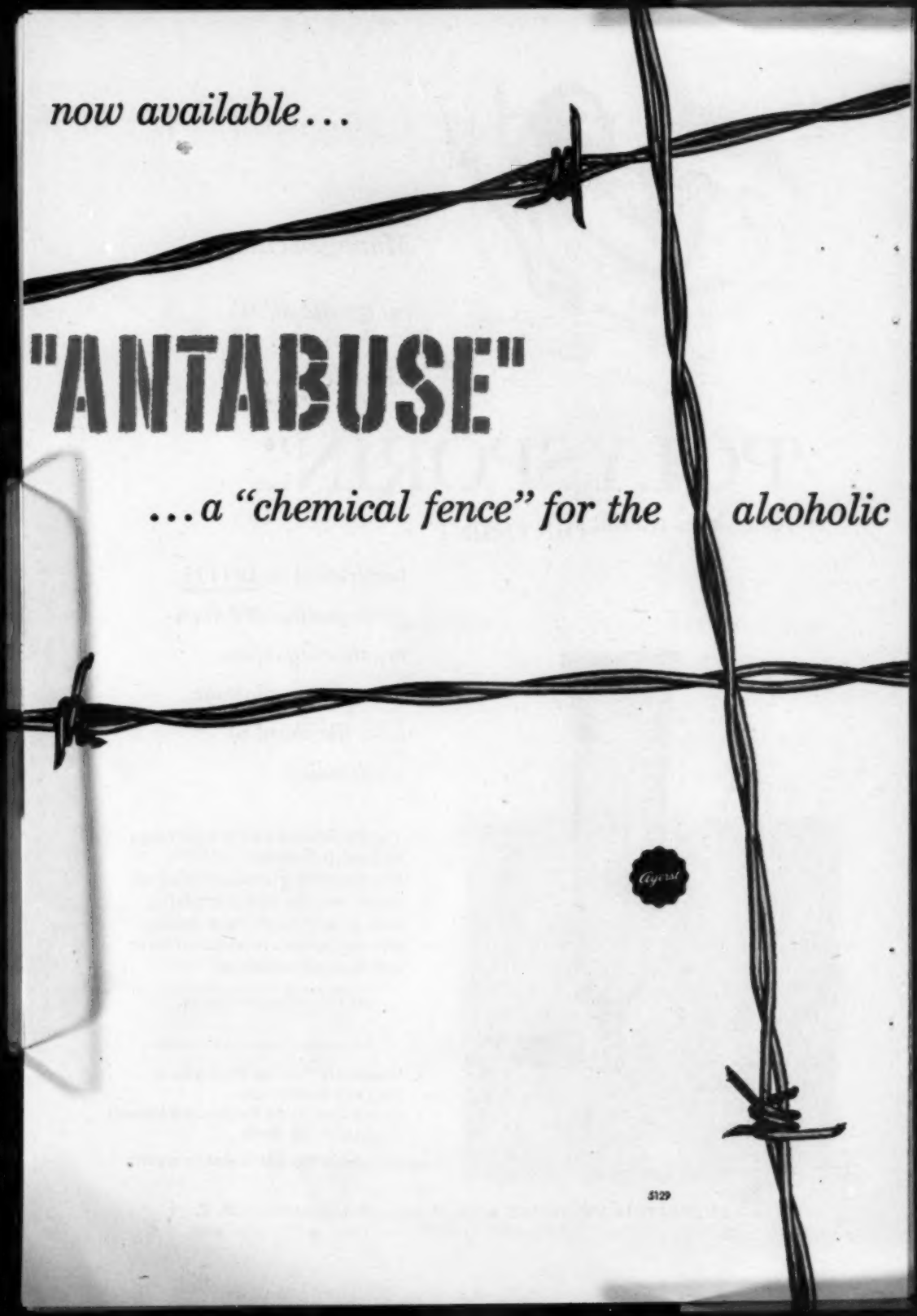
Complete information will be sent on request

BURROUGHS WELLCOME & CO. (U.S.A.) INC., *Tuckahoe 7, N. Y.*

now available...

"ANTABUSE"

...a "chemical fence" for the alcoholic



Ayerst

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Much has been written about "Antabuse." Many alcoholics have long awaited its benefits.

Now, after nearly three years of intensive clinical research, it is available for prescription use.

"Antabuse" sets up a sensitizing effect to ethyl alcohol. It builds a "chemical fence" around the alcoholic . . . helps him develop a resistance to his craving. Its high degree of efficacy is confirmed by extensive clinical evidence.

"Antabuse" is safe therapy when properly administered. However, it should be employed only under close medical supervision. Complete descriptive literature is available and will be gladly furnished on request.

"Antabuse" is identical with the material used by the original Danish investigators, and is supplied under license from Medicinalco, Copenhagen, Denmark. U. S. Pat. No. 2,567,814.

Tested in more than 100 clinics . . .
by more than 800 qualified investigators . . .
on more than 5,000 patients . . . and covered by
more than 200 laboratory and clinical reports.

"ANTABUSE"®

. . . brand of specially prepared and highly purified tetraethylthiuram disulfide.

Supplied in tablets of 0.5 Gm., bottles of 50 and 1,000.

Ayerst, McKenna & Harrison Limited • New York, N. Y. • Montreal, Canada

Guide

RODUCTS

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Auralgan

after 40 years still the auralgesic

NEW O-TOS-MO-SAN

BACTERICIDAL

Gram-negative • Gram-positive

FUNGICIDAL

NON-TOXIC

NON-IRRITATING

Proved effective against antibiotic resistant strains of organisms

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RHINALGAN

SAFE

Acts locally NOT systemically

RECTALGAN—Liquid

NOT A SUPPOSITORY

NOT AN OINTMENT

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Detailed information sent on request

MICAL CORP., 100 Varick Street, New York 13, N. Y.

What it takes

to CONTROL COUGH

BENYLIN EXPECTORANT rapidly relieves cough because it combines BENADRYL hydrochloride (10 mg. per teaspoonful), with established non-narcotic remedial agents. BENYLIN EXPECTORANT liquefies mucous secretion, relaxes the bronchial musculature, soothes irritated mucosa and relieves nasal stuffiness, sneezing and lacrimation. Its mildly tart taste appeals to adults as well as children.

Benylin® EXPECTORANT

EXPECTORANT
DECONGESTANT
ANTISPASMODIC
ANTIHISTAMINIC
DEMULCENT
NON-NARCOTIC
PALATABLE

DOSAGE: One or two teaspoonfuls every two to three hours. Children, one-half to one teaspoonful every three hours.
Supplied in 16-ounce and 1-gallon bottles.

PARKE, DAVIS & COMPANY

MEDICAMENTA VERA


Schering ANNOUNCES

NEW

DORMISON*

new, non-barbiturate hypnotic for safe, sound sleep without drug hangover free from habit-forming properties of the barbiturates

safe
free from habit-forming or addiction properties of barbiturates; rapidly metabolized; no cumulative action; no toxic effects on prolonged use

acts gently and quickly in insomnia
mild hypnotic action quickly induces restful sleep

no prolonged suppressive effect
action subsides after a few hours; patient continues to sleep naturally

no drug hangover
patient awakens refreshed with no "drugged" feeling

DORMISON is a substance new to pharmacology, completely different from barbiturates and other hypnotics. It contains only carbon, hydrogen and oxygen. It has no nitrogen, bromine, urea residues, sulfone groups or chemical configurations present in depressant drugs now in use.

The usual dose of DORMISON (methylparafynol†) is one or two capsules, taken just before the patient is ready for sleep. DORMISON's wide margin of safety allows liberal adjustment of dosage until the desired effect is obtained. DORMISON is supplied as 250 mg. soft gelatin capsules in bottles of 100.

SCHERING

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*T.M. †U.S. Pat. Pending

DORMISON

LETTERS TO THE EDITOR

This department is offered as an Open Forum for the discussion of topical medical issues. All letters must be signed. However, to protect the identity of writers, who are invited to comment on controversial subjects, names will be omitted when requested.

NEW READER WRITES

"I have received the general practice journal, MEDICAL TIMES, for three months and I am writing to tell you that I appreciate it and find it very much worthwhile."

Bernice H. Tyner, M.D.
Colorado Springs, Colo.

DR. HERRON WRITES AGAIN

"MEDICAL TIMES has always been of great assistance in keeping up to date. Your refresher articles are particularly interesting.

"We do appreciate your interest in our behalf."

Earl Herron, M.D.
Chicago, Ill.

EXCELLENT FOR BUSY PRACTITIONER

"MEDICAL TIMES is excellent, especially for busy practitioners, as it is condensed and practical. Above all it gives the recent advances in therapeutics."

H. B. Christianson, M.D.
Superior, Wis.

"I thought the colitis article in your October issue was excellent. Also find your office surgery articles very helpful."

B.F.M., M.D.
Oak Park, Ill.

Available in bottles of 100 capsules at all prescription pharmacies

Nutritional Deficiencies Pave the Way for "Reproductive Failure"

"It is obvious to anyone . . . that reproductive failure can result from quantitative and qualitative deficiencies of the mother's diet Sterility, resorption or abortion of the fetus, stillbirth, prematurity, prolonged gestation and weakness of the offspring can be caused by dietary nutritional deficiencies."

Warkany, J.: Experimental Studies on Nutrition in Pregnancy, Obst., & Gynec. Sur., Oct. 1948, p. 693.

OBRON—a balanced nutritional supplement *specifically* designed for the OB patient, provides 8 vitamins and 11 minerals and trace elements including calcium, phosphorus, iron and iodine.

OBRON is especially beneficial during the period of lactation to protect the nutritional status of the mother and her nursing child.

For the OB patient... OBRON

Each Capsule Contains:

Dicalcium Phosphate Anhydrous*	768 mg.	Calcium Pantothenate	3.0 mg.
Ferrous Sulfate U.S.P.	64.8 mg.	Cobalt	0.033 mg.
Vitamin A	5,000 U.S.P. Units	Copper	0.33 mg.
Vitamin D	400 U.S.P. Units	Iodine	0.05 mg.
Thiamine Hydrochloride	2 mg.	Manganese	0.33 mg.
Riboflavin	2 mg.	Magnesium	1.0 mg.
Pyridoxine Hydrochloride	0.5 mg.	Molybdenum	0.07 mg.
Ascorbic Acid	37.5 mg.	Potassium	1.7 mg.
Niacinamide	20.0 mg.	Zinc	0.4 mg.

*Equivalent to 15 gr. Dicalcium Phosphate Dihydrate

ROERIG Rx

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536 N. Lake Shore Drive • Chicago 11, Ill.

"INTANGIBLES"

REMEDIAL MEASURES that promise a solution to a therapeutic problem are often beset by "intangibles" that cannot be perceived, and require time to reveal what may not even have been suspected.

Several years passed before it was evident that mineral oil, used as a laxative, dissolves and removes fat-soluble vitamins from the food in the intestine, and though supposedly not absorbable, enters the mesenteric lymph nodes, the spleen, and the liver, causing interference with hepatic function[1,2].

Not long after their introduction, it was found that certain bulk-producing laxatives have an affinity for certain food elements, notably calcium and phosphorus. The body is deprived of these minerals when they combine with the bulk-producing laxative and are carried out from the intestinal tract[3]. Morgan[4], from studies of pure cellulose, expresses doubt that its laxative action counterbalances the detrimental effect on mineral retention.

Macht and Finesilver[5] found by laboratory experiments and clinical study that a saline cathartic prevents the absorption, and consequently the effect, of other drugs taken simultaneously or quite some time later.

A half-century of extensive use, however, has proved that phenolphthalein is not encumbered by similar latent intangibles. The "moderate," gradual laxative action of phenolphthalein does not interfere with the normal digestive processes. Phenolphthalein absorbs nothing from the intestinal tract, and is compatible with other therapeutic substances, including the sulfonamides and the antibiotics.

That phenolphthalein is safe in a wide range of dosage at all age periods may be gathered from the statement of Beckman[6] that an infant of eighteen months may be given as much as one-half grain, representing one-half of the U.S.P. dose for adults. The innocuousness of phenolphthalein is further proved by the report of Blatt, Steigmann, and Dyniewicz[7] of an accidental overdose of 260 times the dose for age, in which no serious effect, only laxation, occurred. A similarly uneventful clinical course was reported by Sachs[8] from an overdose 182 times the normal dose for age.

The uniform efficiency of the phenolphthalein used in Ex-Lax is assured by biological standardization. By incorporating phenolphthalein in a pleasant-tasting chocolated base, Ex-Lax presents a laxative that is easy to take by adults and easy to give to children. The palatability of Ex-Lax is particularly advantageous when taste requires special consideration, as during pregnancy.

A trial supply of Ex-Lax, and a handy, leather-bound pocket notebook, containing references often needed in medical practice, will be gladly sent to physicians upon receipt of name and address.
Ex-Lax, Inc., Brooklyn 17, New York

---

1. W. A. Stryker: Arch. Path. 31:670, 1941.
2. A. C. Frazer et al.: Nature 149:167, 1942.
3. W. A. Bastedo: Pharmacology, Therapeutics and Prescription Writing. Saunders, 1947; p. 187.
4. J. W. Morgan: J.A.M.A. 117:1335, 1941.
5. D. I. Macht and E. M. Finesilver: Bull. Johns Hopkins Hosp. 33:330, 1922.
6. H. Beckman: Treatment in General Practice. Saunders, 1946; p. 578.
7. M. Blatt, F. Steigmann, and J. M. Dyniewicz: J. Pediat. 22:719, 1943.
8. W. Sachs: J.A.M.A. 104:45, 1935.

double *the power to resist food* **in obesity!**

Long-established habits of catering to an enormous appetite and the "love for eating" make the problem of weight reduction doubly difficult. It requires a strong will-power to adhere to a restricted dietary regimen day after day . . . for dietary restriction and lack of bulk create a gnawing sense of emptiness that impels violation of the diet. Bulk hunger, as well as excessive appetite, therefore, must be controlled.

Based upon the modern concept of hunger and appetite, Obocell makes reducing easy. Obocell is a new therapeutic adjunct that curbs appetite, suppresses bulk hunger, elevates the mood and **doubles** the power to resist food.

Each Obocell tablet contains Dextro-Amphetamine Phosphate, 5 mg.; Methylcellulose, 150 mg. **Dose:** Three to six tablets daily, usually given 30 minutes before meals. **Supplied:** Bottles of 100, 500, 1000.

Literature and Samples on Request

IRWIN, NEISLER & COMPANY • Dept. MT • **DECATUR, ILLINOIS**

Research to Serve Your Practice

Obocell®

A COMBINED HUNGER AND APPETITE DEPRESSANT

only one application of EURAX® blocks the *"itch-scratch reflex"* for 6 to 8 hours

The prompt, prolonged and effective action of the new antipruritic, EURAX, has been authoritatively reported in leading dermatologic journals.[1-5]

EURAX affords "complete relief" in two out of every three cases and "considerable relief" in the majority of the remainder.[1] Not an antihistaminic, not a -caine derivative . . . EURAX is virtually nonsensitizing and nontoxic,[1-3] and, importantly, does not lose its effectiveness after continued use.[2]

***In addition to its nonspecific antipruritic properties,* EURAX *is a potent scabicide.*[6-11]** Only 1-2 applications produce cure rates ranging up to 100 per cent with the added advantage that the bacteriostatic properties of EURAX effectively control secondary coccal infections.

EURAX . . . the new long-lasting antipruritic

EURAX (brand of crotamiton) contains N-ethyl-o-crotonotoluide* in a 10 per cent concentration in a vanishing cream base.

Tubes of 20 Gm. and 60 Gm. and jars of 1 lb.

bibliography: (1) Cooperon, M.: J. Invest. Dermat. *13*:35, 1949. (2) Peck, S. M., and Michelfelder, T. J.: New York State J. Med. *50*:1934, 1950. (3) Soiler, A. A.: Quart. Rev. Int. Med. & Dermat. *8*:3, 1951. (4) Johnson, S. M., and Bringe, J. W.: Arch. Dermat. & Syph. *63*:768, 1951. (5) Hitch, J. M.: Clinical Appraisal of a New Antipruritic (N-ethyl-o-crotonotoluide), to be published. (6) Tobias, N.: G. P. *4*:43, 1951. (7) Domenjoz, R.: Schwein. med. Wchnschr. *76*:1210, 1946. (8) Patterson, R. L.: South. M. J. *43*:449, 1950. (9) Pierce, H. E., Jr.: J. Nat. M. A. *43*:107, 1951. (10) Hand, E. A.: J. Michigan M. Soc. *49*:1286, 1950. (11) Tronstein, A. J.: Ohio State M. J. *45*:909, 1949.

*U.S. Pat. #2,505,681

E-43

Geigy **GEIGY PHARMACEUTICALS** • Division of Geigy Company, Inc.
220 Church Street, New York 13, New York

for Control

in Sedation and Hypnosis...

Neuronidia®

(Elixir of diethylmalonylurea — Schieffelin)

Neuronidia **is an effective sedative and hypnotic. It may be safely used in insomnia, hysteria, neurasthenia, thyroid diseases, chorea and mental disturbances.** ***Neuronidia*** **is indicated in virtually all cases of nervous disturbances uncomplicated by pain.**

Pharmacological and clinical research have demonstrated that the depth and degree of sedation and hypnosis can be readily controlled with barbital, the active ingredient of

NEURONIDIA

Neuronidia **contains per teaspoonful:**
0.13 Gm. diethylmalonylurea

Dosage: **Orally, as a sedative**
½ to 1 teaspoonful repeated as indicated
As a hypnotic
2 teaspoonfuls before retiring

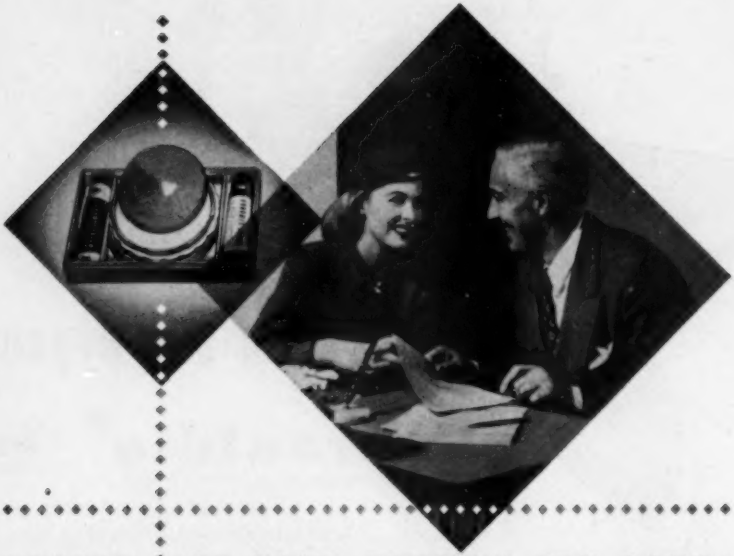
℞ Sodium salicylate ʒIV
Neuronidia ʒIV

Sig: ***To induce sleep and produce analgesia***
one dessertspoonful at bedtime.
For sedation and analgesia
One teaspoonful two or three times daily as required.

Supplied: **Bottles of 8 fluid ounces, and 1 gallon**

Professional samples and literature are available on request.

Schieffelin & Co. *since 1794* / *pharmaceutical and research laboratories*
24 Cooper Square, New York 3, N. Y.



DOCTOR, LET YOUR PATIENT TRY BOTH!

The highest index for successful contraception is best met by allowing the patient to select the spermicidal lubricant which is aesthetically acceptable. Whether you prefer to recommend the use of Koromex Diaphragm with or without the introducer, generous sized tubes of both Koromex Jelly and Cream are supplied at no charge. Koromex Cream is slightly less lubricating than Jelly.

ACTIVE INGREDIENTS: BORIC ACID 2.0% OXYQUINOLIN BENZOATE 0.03% AND PHENYLMERCURIC ACETATE 0.02% IN SUITABLE JELLY OR CREAM BASES

KOROMEX

A CHOICE OF PHYSICIANS

HOLLAND-RANTOS COMPANY, INC. • 145 HUDSON ST., NEW YORK 13, N. Y.

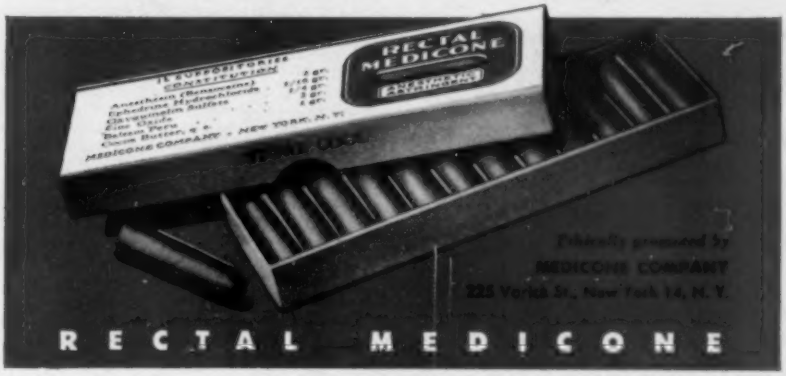
MERLE L. YOUNGS, PRESIDENT

Clinical success in postpartum hemorrhoids

From a clinical report of 79 cases of postpartum hemorrhoids, treated with RECTAL MEDICONE at a large New York institution, the following results were tabulated:

NO. OF CASES	TYPE	RESULTS
41	SUBACUTE	38 SATISFACTORY RESPONSE
22	ACUTE	22 RELIEF IN ALL CASES
16	CHRONIC	10 SATISFACTORY RESPONSE *(4 of the 16 cases required surgery)*

The explanation for these highly favorable results in this painful condition lies in the fact that RECTAL MEDICONE SUPPOSITORIES contain benzocaine for topical anesthesia—reinforced by other effective anti-hemorrhoidal agents, which promote retrogression and healing.



MODERN MEDICINALS

These brief resumes of essential information on the newer medicinals, which are not yet listed in the various reference books, can be pasted on file cards and a record kept. This file can be kept by the physician for ready reference.

Antosen, E. R. Squibb & Sons, Inc., New York 22, N. Y. For coughs due to colds or associated respiratory infections when a combined anti-secretory-sedative effect is desired. **Dose:** Adults: One to 3 teaspoonfuls every 3 to 4 hours. Children: One half to 1 teaspoonful every 3 to 4 hours. **Sup.:** In pints and gallons.

B-Complex 12, E. R. Squibb & Sons, Inc., New York 22, N. Y. Dietary supplement for the prevention of B vitamin deficiencies. **Dose:** One capsule daily. **Sup.:** In bottles of 100, 1,000 and 5,000 capsules.

Banthine with Phenobarbital, G. D. Searle & Co., Chicago 80, Ill. In peptic ulcer therapy. **Dose:** As indicated. **Sup.:** In bottles of 100 tabs.

Chloresium Mucinoid Powder, Rystan Co., Inc., Mount Vernon, N. Y. New name. Formerly known as Chloresium Powder.

Chloresium Mucinoid Tablets, Rystan Co., Inc., Mount Vernon, N. Y. Chlorophyll therapy for peptic ulcer. **Dose:** As indicated. **Sup.:** In bottles of 50 and 200 tabs.

Crysticillin Suspension Unimatic, E. R. Squibb & Sons, Inc., New York 22, N. Y. For the prophylaxis and treatment of infections caused by gram positive cocci, gram negative diplococci, spirochetes, and gram positive bacilli. **Dose:** A single daily injection of 300,000 units is adequate for most cases. **Sup.:** The Unimatic syringe is supplied with a sterile 20 gauge needle. Syringe contains 300,000 units of procaine penicillin G.

Desiguent-Bacitracin, Upjohn Co., Kalamazoo 99, Michigan. In treating infected wounds in skin conditions susceptible to bacitracin. **Dose:** As indicated. **Sup.:** In 1 oz and 2 oz. jars.

Desplex, Grant Chemical Co., New York 16, N. Y. For threatened and habitual abortion and premature labor. **Dose:** As indicated. **Sup.:** In containers of 30, 100 and 500 tabs., and in 0.05, 0.1, 0.25, 0.5, 1, 5, 50 and 100 mg. tabs.

Diodoquin, G. D. Searle & Co., Skokie, Ill. New dosage form reduces number of tabs. necessary for treatment of amebiasis. **Dose:** As indicated. **Sup.:** In bottles of 60 and 500 tabs.

Estan, White Labs., Inc., Newark 7, N. J. For use in menopause, dysmenorrhea, male climacteric, postpartum suppression of lactation, osteoporosis, and malnutrition. **Dose:** Orally, as indicated. **Sup.:** In bottles of 30 and 100 tabs.

Gentasol (brand of sodium gentisate). Gold Leaf Pharm. Co., Inc., New Rochelle, N. Y. For the symptomatic treatment of acute rheumatic fever and rheumatoid arthritis. **Dose:** Orally, in acute rheumatic fever, 4 tabs. (2 Gms.) every 3 hours, continued for at least 10 days after the temperature becomes normal. In other conditions which may involve prolonged therapy, the total daily dose should not exceed 10 Gms. **Sup.:** In bottles of 0.5 Gm. tabs., in quantities of 50, 100, 500 and 1,000.

Hemo-Vatine, Smith-Dorsey Co., Lincoln, Nebraska. In B-complex deficiencies and in certain macrocytic anemias. **Dose:** Adult: 1 vial. **Sup.:** In combination package, six 2 cc. vials with one 10 cc. vial diluent.

Hycidaron Tablets, The Warren - Teed Products Co., Columbus 8, Ohio. For those cases of chronic or refractory hypochromic anemias which will not respond to ordinary therapeutic measures. **Dose:** One or 2 tabs. 2 or 3 times daily after meals, according to requirements of patient. **Sup.:** In bottles of 100, 500 and 1,000 tabs.

—Concluded on page 60a

straining at stool:

always distressing . . .
frequently dangerous
. . . sometimes deadly

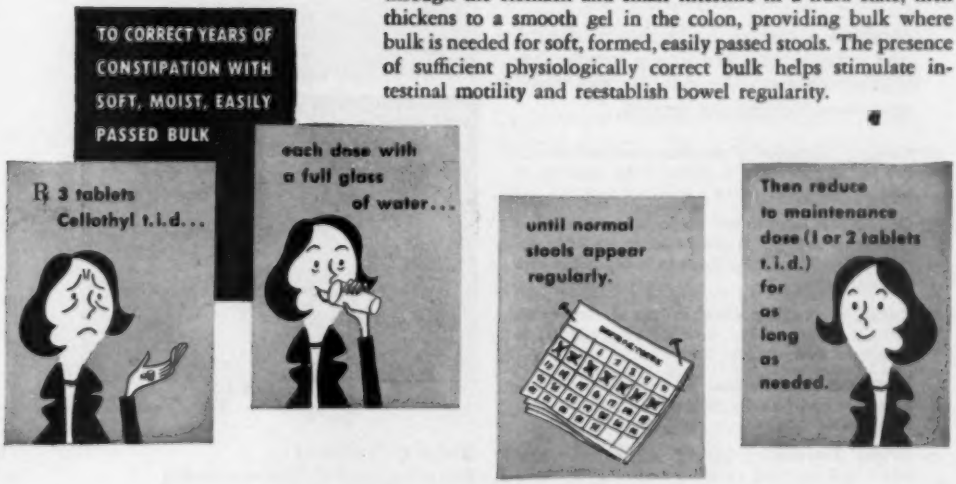
The very states in which straining at stool can be most dangerous are conditions which invite constipation: cardiac dysfunction, hernia, pregnancy, anorectal disease and postsurgical states. In their presence, such almost unavoidable factors as inactivity, dietary restriction, weakness and local trauma lead to constipation due to bowel stasis, bulk deficiency or dyschezia.

Prevention of the need to strain has become an important part of therapy in such states. Fortunately, natural, comfortable bowel function can be achieved and maintained with Cellothyl without fear of interference with other therapeutic measures or of inducing cathartic addiction.

Where constipation exists, it can be corrected with Cellothyl; where it is likely to occur, it can be prevented. The ease and frequency of bowel movements improves as Cellothyl reestablishes normal function by correcting several common and related factors:

1. ***bulk deficiency** . . . by providing adequate bulk of proper consistency*
2. ***intestinal stasis** . . . by encouraging peristaltic action through gentle mechanical stimulation*
3. ***dyschezia** . . . by assuring soft, moist, easily passed stools.*

The physician using Cellothyl has the advantage of providing medication which is nontoxic, nonantigenic and nonreactive in the gastrointestinal tract. It causes no bloating or distention, no frequent, urgent calls to stool. Its action is physiologically correct. Following the normal digestive gradient, Cellothyl passes through the stomach and small intestine in a fluid state, then thickens to a smooth gel in the colon, providing bulk where bulk is needed for soft, formed, easily passed stools. The presence of sufficient physiologically correct bulk helps stimulate intestinal motility and reestablish bowel regularity.



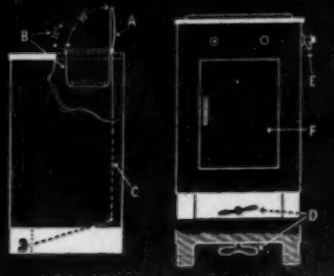
Cellothyl® BRAND OF METHYLCELLULOSE ESPECIALLY PREPARED BY THE CHILCOTT PROCESS

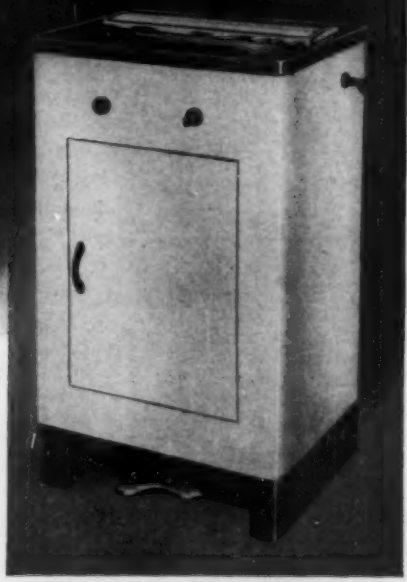
Cellothyl tablets (0.5 Gram) in bottles of 100, 500 and 5000.

CHILCOTT *Laboratories* DIVISION OF The Maltine Company

MORRIS PLAINS, NEW JERSEY

Ultra-Modern in every detail





"American" CABINET MODEL
SMALL INSTRUMENT STERILIZERS

combine *exclusive* highlights in design and construction that insure greater operating safety, convenience and long periods of satisfactory service.

(a) **Cover**—fabricated of stainless steel and elevating to full 90° angle to permit easy removal of tray without interference.

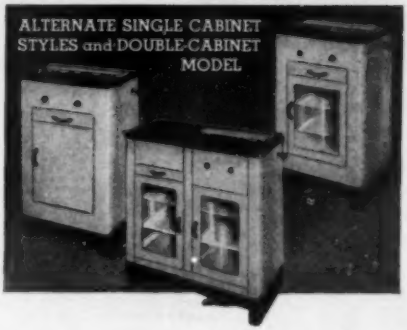
(b) **Cover**—elevates to 30° angle before immersed tray starts to raise, thus enabling operator to observe water level at all times to insure immersion of instruments.

(c) **Cover Elevating Mechanism** — Concealed entirely within cabinet, thus allowing cabinet to be placed flush against the wall.

(d) **Recessed Foot Pedal**—Eliminates tripping annoyances and permits greater freedom of access for operator.

(e) **Drain Faucet**—a special screw-type valve which will not stick or score and may be taken apart instantly for cleaning without tools.

(f) **Doors**—Solid double-panel or glass, hung on fully concealed steel hinges, fitted with Bakelite handle, spring catches and rubber bumpers.



BURN-OUT-PROOF!
An automatic safety measure protecting both Sterilizer and instruments against possible damage due to depletion of water supply in chamber.

ASK YOUR DEALER or write us for further information

AMERICAN STERILIZER COMPANY
Erie, Pennsylvania.

To encourage normal healing

in
wounds
ulcers
burns
dermatoses

40% PRICE REDUCTION
effective Sept. 1st

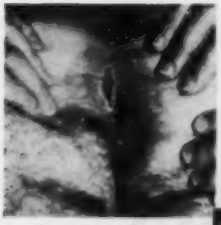
Chloresium

Ointment
and
Solution (Plain)
brand of water-soluble chlorophyll derivatives

for instance,

in pilonidal cyst wounds

Routine postoperative use of CHLORESIUM OINTMENT and SOLUTION (Plain) goes far towards overcoming the problem of the slow healing pilonidal lesion.



A Appearance of wound 12 weeks after final excision of pilonidal sinus, prior to CHLORESIUM therapy.

B Same wound 17 days later. Complete healing was obtained after 8 days of CHLORESIUM therapy.

In a series of 19 pilonidal cases[1] treated with CHLORESIUM, 17 "healed better and more rapidly than by other methods previously employed." In another study of over 100 cases,[2] CHLORESIUM produced "... prompt, clean healing with firm granulation. Further, the chlorophyll ointment immediately eliminates the foul odor often encountered in pilonidal wounds and in this respect it is a boon to patient and physician alike."

CHLORESIUM OINTMENT and SOLUTION (Plain) contain water-soluble derivatives of chlorophyll "a" as standardized in N.N.R. These derivatives, highly concentrated and purified, provide the optimum therapeutic benefits obtainable from chlorophyll.

CHLORESIUM OINTMENT — 1-ounce and 4-ounce tubes

CHLORESIUM SOLUTION (Plain) — 2-ounce and 8-ounce bottles

1. Bowers, W. F.: Chlorophyll in Wound Healing and Suppurative Disease, Am. J. Surg. 73:37, 1947.
2. Niemiro, B. J.: Delayed Healing in Pilonidal Cyst Wounds, Journal Lancet, Sept. 1951.

RYSTAN COMPANY, INC. Mount Vernon, New York

For Mild, Gradual,

Prolonged Vascular Dilatation in

Arterial Hypertension

As a valuable adjunct to rest and other accepted therapeutic measures, Erythrol Tetranitrate induces mild, gradual vascular dilatation.

Orally administered, Erythrol Tetranitrate Merck lessens the muscular tone of arteries, tending to decrease the effect of blood pressure on the arterial walls and thereby relieving the burden on the heart.

Its action in increasing the flow of blood and oxygen to the myocardium makes it useful also for prophylaxis of attacks of angina pectoris.

Literature will be mailed on request.

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(Erythrityl Tetranitrate U.S.P.)

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THIS BOOK MAY BE WORTH
$100 OR MORE TO YOUR PATIENT!

"Frauds and Facts"*

...the whole truth about Hearing Aids

*Members of the Medical Profession will receive a FREE copy by mail

THIS BOOK is published only to give the *facts* about hearing aids—not to get names, not to solicit those with impaired hearing. "Frauds and Facts" tells—simply—the whole truth about hearing aids.

Grateful acknowledgement is given The Journal of The American Medical Association, whose article on "Hearing Aids and Advertising," June 16, 1951, inspired the creation of this book.

"FRAUDS AND FACTS" Answers Vital Questions

Now—in one complete book—Zenith Radio Corporation takes off the gloves—and *answers* these questions—strips *all* the mystery from hearing aid buying.

"What does the American Medical Association say about hearing aids?" "Are 'invisible' aids *really* invisible?" "How can I tell what maker tells the truth about his hearing aid?" "Why should I go to my doctor for advice about hearing?" "How can I hear better for less money?" "What is true, and what leads only to more unhappiness in hearing aid claims?"

When you have read your copy of "Frauds and Facts," Zenith will be grateful for your comment. Replies may be sent to the address below.

Zenith Protects Doctors' Recommendation of Zenith Hearing Aids

Hear better or pay nothing! We believe no hearing aid need sell for more than $75. Here is Zenith's unconditional guarantee of quality: "If any $200 aid in your opinion, in any way outperforms a $75 Zenith, YOUR MONEY BACK (under our unconditional 10-day return privilege). You are the sole judge."

With this guarantee, doctors are free to recommend Zenith Hearing Aids with confidence. The patient can try the aid under normal conditions of use. He determines its efficiency, measures its performance, while checking with his doctor, before being committed to buying it.

ZENITH ROYAL
$75

Tiny, light-weight, in beautiful golden finish. Complete, ready to wear. See also the Zenith "*Super Royal*" especially designed for severe hearing loss. Same fine features. Same low price.

ZENITH
The Royalty of Hearing

Zenith Hearing Aids

By Makers of World-Famous Zenith Radio, Television and FM Sets
Bone Conduction devices available at moderate extra cost

Zenith Radio Corporation
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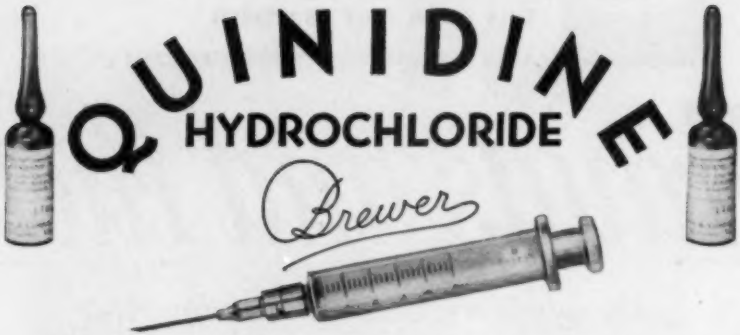
INJECTABLE

QUINIDINE HYDROCHLORIDE



FIRST *INJECTABLE QUINIDINE COMMERCIALLY AVAILABLE IN AMERICA*

TRIED - TESTED - DEPENDABLE - STABLE

For those cases of auricular fibrillation and paroxysmal tachycardia where QUINIDINE is indicated and cannot be given, or is not effective, orally—

Administration: INTRAMUSCULARLY or if necessary INTRAVENOUSLY

Available: Quinidine Hydrochloride Injectable (0.6 Gm.) in 5 cc. ampul
Quinidine Hydrochloride Injectable (0.18 Gm.) in 1½ cc. ampul

REFERENCES:

1. Sturnick, M. I.; Riseman, J. E. F.; and Sagall, E. I.: Studies on the Action of Quinidine in Man: J. A. M. A. 121; 917 (March 20) 1943
2. Sagall, E. I.; Horn, C. D.; and Riseman, J. E. F.: Studies on the Action of Quinidine in Man: Arch. Int. Med. 71; 460 (April) 1943
3. Armbrust, Chas. A. Jr. and Levine, Samuel A.: Paroxysmal Ventricular Tachycardia: A Study of 107 Cases: Circulation, 1; 28-39 (Jan.) 1950
4. Bell, G. O.; Bradley, R. B.; and Hurxthal, L. M.: Paroxysmal Tachycardia, Experiences with Massive Doses of Quinidine Intravenously in a Refractory Case: Circulation, 1: 939 (April Part II) 1950

For additional information — just send your ℞ blank marked MT-11

Also Available

FOR ORAL ADMINISTRATION
Quinidine Sulfate Tablets and Capsules (3 gr.) in bottles of 100, 500 & 1000.

BREWER & COMPANY, INC.
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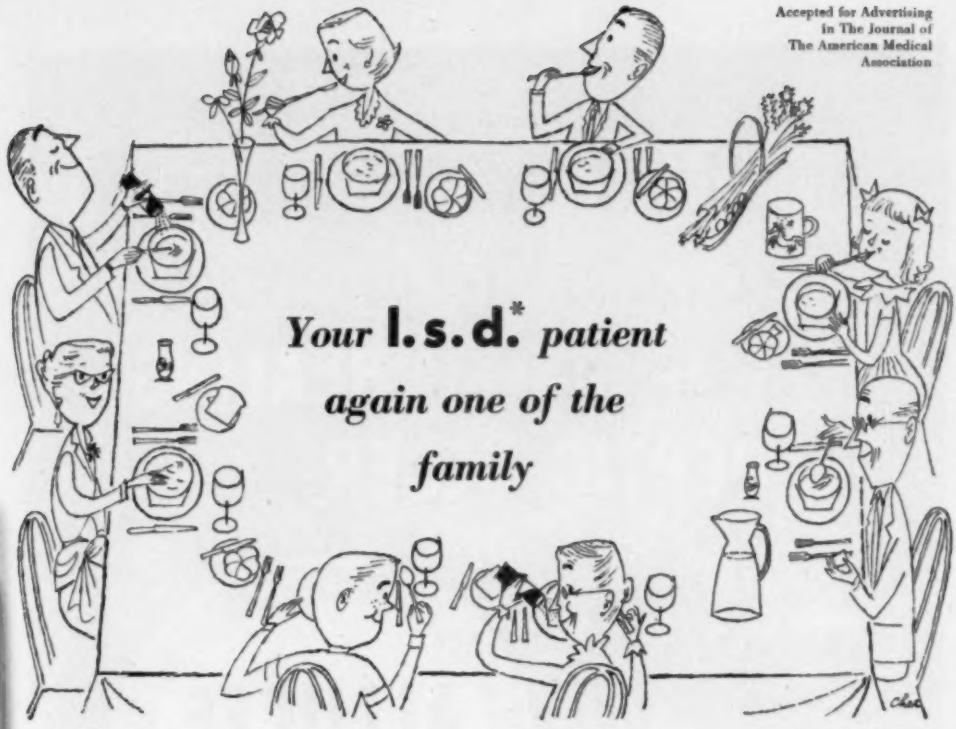


With Diasal, the **low sodium diet*** patient can once again enjoy his meals. Diasal is used just like salt…it tastes, looks and pours like salt; it contains only recognized ingredients and is safe for prolonged use; it may be used like salt at the table and in *cooking*. No wonder Diasal meets the basic requirements of a good salt substitute,[1] and besides keeps salt-restricted patients happy on low-sodium diets.

Diasal contains no ammonium, lithium or sodium. It is a simple formulation of potassium chloride, glutamic acid, and inert excipients. Because a depleted potassium state may occur in patients on a low-sodium diet,[2] Diasal may provide an efficient, convenient and safe means of supplying potassium in prophylactic amounts to the depleted diet. Diasal is contra-indicated only in severe renal disorders and oliguria. Diasal is available in 2 oz. shakers and 8 oz. bottles.

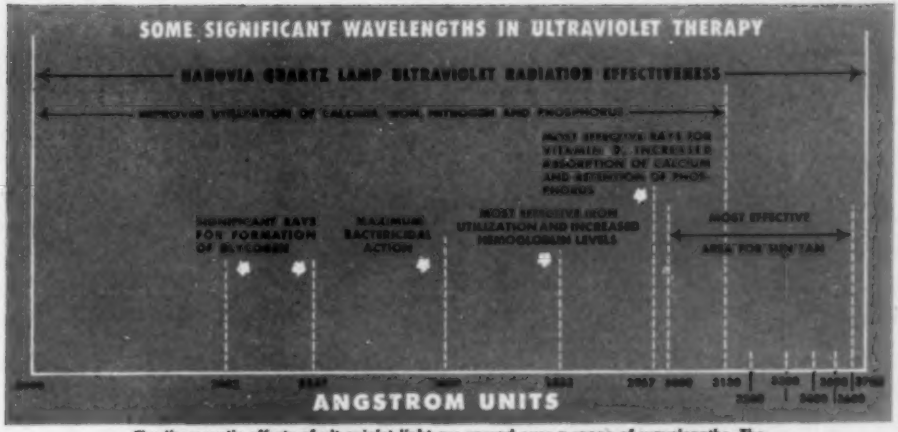
1. Rimmerman, A.B., and Halpern, A.: A comparative study of sodium-free salt substitutes. Am. Pract. & Dig. Treatment 2:168 (February) 1951.
2. Fremont, R.E.; Rimmerman, A.B., and Shaftel, H.E.: The occurrence and management of the low potassium state with patients on the low sodium diet. Postgraduate Med. 9:—(September) 1951.

for new zest in salt-restricted diets

DIASAL®

For samples and low-sodium diet sheets write

E. FOUGERA & Company, Inc. • 75 Varick Street, New York 13, N. Y.



The therapeutic effects of ultraviolet light are spread over a range of wavelengths. The specific wavelengths shown on the chart are the significant ones for the effects indicated.

HANOVIA ULTRAVIOLET THERAPY

A valuable adjuvant in physical rehabilitation

HANOVIA PRESCRIPTION MODEL ULTRAVIOLET LAMP

Studies of the therapeutic values of different wavelengths of ultraviolet radiation have demonstrated the importance of using a lamp that will deliver adequate radiant energy in the most effective wavelengths.

For example, the formation of glycogen is stimulated within the range of 2537-3130 angstrom units. Again, wavelengths 2482, 2537, 2652, and 2803 are particularly effective for increasing blood hemoglobin levels and for improving the utilization of calcium, iron, iodine and phosphorus in the blood. The same wavelengths also are highly effective bactericidally and accelerate the healing power of the blood.

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For supplementary home treatments encourage your patients to purchase Hanovia Prescription Model Ultraviolet Lamps. Convenient payment terms if desired. Write for literature and the name of our nearest representative. Hanovia Chemical & Manufacturing Co., Dept. MT-11, 100 Chestnut St., Newark 5, N. J. Showrooms and offices in Boston, Chicago, Cleveland, Detroit, Indianapolis, New York, Philadelphia, San Francisco, Washington, D. C.

HANOVIA

MADE BY THE WORLD'S LARGEST PRODUCER OF ULTRAVIOLET EQUIPMENT FOR HOSPITALS, THE MEDICAL PROFESSION, INDUSTRY, THE LABORATORY AND THE HOME

7½ gr.

7½ gr. (0.5 Gm.) *BLUE* CAPSULES CHLORAL HYDRATE – *Fellows*

• DESIRABLE SLEEP

lasting from five to eight hours, usually free from undesirable after-effects. Pulse and respiration are slowed in the same manner as in normal sleep. Reflexes are not abolished and the patient can be readily aroused.[2] "CHLORAL HYDRATE produces a normal type of sleep, and is rarely followed by 'hangover'."[1]

Dosage: One to two 7½ gr., or two to four 3¾ gr. capsules at bedtime.

CAPSULES CHLORAL HYDRATE – *Fellows*

ODORLESS • NON-BARBITURATE • TASTELESS

3¾ gr. (0.25 Gm.) *BLUE and WHITE* CAPSULES CHLORAL HYDRATE—*Fellows*

• DAYTIME SEDATION

for the patient who needs daytime sedation and relaxation with complete comfort.

Dosage: One 3¾ gr. capsule three times a day, after meals.

3¾ gr.

EXCRETION — Rapid and complete, therefore no depressant after-effects.[3, 4]

Available: Capsules CHLORAL HYDRATE — Fellows
3¾ gr. (0.25 Gm.) Blue and white capsules . . . bottles of 24's and 100's
7½ gr. (0.5 Gm.) Blue capsules . . . . . bottles of 50's

Professional samples and literature on request

Fellows MEDICAL MFG. CO. INC. *Pharmaceuticals*

pharmaceuticals since 1866
26 Christopher St., New York 14, N. Y.

BIBLIOGRAPHY
1. Ryman, H. T.: An Integrated Practice of Medicine (1950)
2. Rubfuss, H. B., et al: A Course in Practical Therapeutics (1948)
3. Goodman, L., and Gilman, A.: The Pharmacological Basis of Therapeutics (1941). 22nd printing, 1951.
4. Goffmann, T.: A Manual of Pharmacology, 7th ed. (1948), and Useful Drugs, 14th ed. (1947)

VERIFIED BY PUBLISHED CLINICAL EVIDENCE

Safer...

Announced at the 41st Annual Meeting of the American Society for Pharmacology and Experimental Therapeutics, MYOCARDONE marks another important advancement in the search for the hormonal control of cardiac function.

Carefully controlled clinical investigations reported in a recent issue of the Journal-Lancet suggest that MYOCARDONE—a new derivative of heart muscle—notably improves the functional efficiency of the heart through cardiotonic and vasodilator actions.

The most recent study[1] involved a group of 58 patients with various cardiac disturbances including:

Cardiac Decompensation—24 patients with dyspnea, dependent edema, pulmonary congestion, orthopnea and hepatomegaly.

Results with MYOCARDONE: More than half showed definite improvement.

Angina Pectoris—19 patients with precordial pain aggravated by exertion and emotional tension.

Results with MYOCARDONE: "10 showed definite and 3 moderate improvement."[2]

Hypertension Without Decompensation—10 patients with symptoms due to hypertension (dizziness, headaches, throbbing, visual disturbance):

Results with MYOCARDONE: "... 6 of the 10 enjoyed relief of the distressing symptoms when taking MYOCARDONE ..."[2]

Compensated Arteriosclerotic Heart Disease—5 patients who had compensated on routine management.

Results with MYOCARDONE: "Three (60%) of the compensated arteriosclerotics maintained compensation with the extract (MYOCARDONE) alone ..."[2]

More Dependable Cardiac Therapy

Myocardone

This report further emphasized:

PROVEN EFFICACY

When MYOCARDONE was administered " . . . Improvement consisted of increased capacity for exertion, decrease or disappearance of symptoms requiring nitroglycerin in the anginal cases, and in disappearance of orthopnea, pulmonary congestion and edema in the decompensated cases."[2]

GREATER SAFETY

"There were virtually no side effects."
"All patients tolerated the drug well."[2]

PROLONGED RESULTS

"Patients whose response to MYOCARDONE was satisfactory, continued to do well for from 2 weeks to several months after the drug was withheld."[2]

Digitalis–Nitrite Replacement

MYOCARDONE advantageously replaces or supplements digitalis therapy. It reduces or eliminates the need for nitrites in angina pectoris.

1. Steigmann, F.; Weiss, A., and Feldman, D.: Clinical Observations on the Efficacy of a Heart Muscle Extract in the Treatment of Cardiovascular Diseases, Federation Proceedings, Vol. 10, p. 490, March, 1951. Reported at the Forty-first Annual Meeting of the American Society for Pharmacology and Experimental Therapeutics.

2. Weiss, A., and Feldman, D.: A Heart Muscle Extract in the Treatment of Cardiovascular Diseases, Journal-Lancet (Aug.) 1951, pp. 320-322.

LITERATURE ON REQUEST

Chemico LABORATORIES, INC.
Indianapolis 20, Indiana

—Concluded from page 46a

Ledercillin Soluble Penicillin Tablets, Lederle Labs., New York 20, N. Y. For making solutions for oral, nasal, aural, and external use; also convenient for making aerosols for intratracheal use. **Dose:** As indicated. **Sup.:** New size, both the 50,000 unit tabs. and the 100,000 unit tebs, can now be obtained in vials of 100. Previously the product was available only in the 24 tab. size.

Mucilose Compound, Winthrop-Stearns Inc., New York 18, N. Y. Bulk laxative. **Dose:** Average dose, 2 tabs. after each meal. **Sup.:** In bottles of 100 and 1,000 tabs.

Mulcin, Mead Johnson & Co., Evansville, Ind. Six essential vitamins in water-dispersible emulsion. **Dose:** One teaspoonful is the recommended daily allowance for children and infants. **Sup.:** In 4 oz. and 16 oz. bottles.

Nembutal Elixir, Abbott Labs., North Chicago, Ill. New elixir has same potency as the old [1 teaspoonful (5 cc.) represents 15 mg. (1/4 gr.) of Nembutal sodium], but color, odor, taste, miscibility and compatibility are improved. **Dose:** As indicated. **Sup.:** In 1 pt. and 1 gal. bottles.

Neocylate with Colchicine, Central Pharmacal Co., Seymour, Ind. For gout and gouty arthritis. **Dose:** As indicated. **Sup.:** In bottles of 200, 500 and 1,000 capsule-shaped tabs.

Omni-Vita Spherettes, William R. Warner, New York 11, N. Y. A candy-like polyvitamin sphere for complete prophylaxis of vitamin deficiency in children more than three years old, and for patients of any age who prefer a chewable medicament. These spherettes are made up of concentric rings, each consisting of a single vitamin and separated from one another by a preservative and protective inert coating. **Dose:** As indicated. **Sup.:** In bottles of 50 spherettes.

Rubrafolin Injection, E. R. Squibb & Sons, Inc., New York 22, N. Y. Anti-anemia therapy, vitamin B_{12} and folic acid for aqueous injection. **Dose:** As indicated. **Sup.:** In 5 cc. vials.

Rubramin Soluble Tablets and Drops, E. R. Squibb & Sons, Inc., New York 22, N. Y. For vitamin B_{12} therapy in children. **Dose:** As indicated. **Sup.:** Rubramin Soluble Tablets in bottles of 100 tabs. Rubramin Drops in 10 cc. dropper bottles with calibrated dropper.

Rubragran, E. R. Squibb & Sons, Inc., New York 22, N. Y. A high potency oral hematinic to produce better blood levels. **Dose:** As determined by the physician. **Sup.:** In bottles of 100 and 500 capsules.

Rulivan, E. R. Squibb & Sons, Inc., New York 22, N. Y. In macrocytic anemias. It may also be used experimentally in nutritional neuropathy and in extreme nutritive failure. **Dose:** As indicated. **Sup.:** In 10 cc. multiple-dose vials.

Sebella Tablets, Wyeth, Inc., Philadelphia 2, Pa. An added therapeutic tool for temporary use in peptic ulcer in which the ingredients take the raw edge off anxiety, inhibits the vagal impulses and neutralizes the excess acid which results from gastric hypermotility. **Dose:** As indicated. **Sup.:** In bottles of 100 tabs.

Semhyten, The S. E. Massengill Co., Bristol, Tenn. For the treatment of essential hypertension and as a prophylactic measure in combating malignant hypertensions. **Dose:** Two capsules 3 times daily. Maintenance dose, 2 capsules 2 times daily or as indicated by patient's progress. **Sup.:** In bottles of 100, 500 and 1,000 capsules.

Semvimin, The S. E. Massengill Co., Bristol, Tenn. A dietary supplement. **Dose:** As a supplement, 1 perle daily. Therapeutic dose, 1 or more perles 3 times daily after meals. Children: 1 perle daily. **Sup.:** In bottles of 100 and 1,000 perles.

Sharcillin, Sharp & Dohme, Philadelphia 1, Pa. Aqueous suspension parenteral, a sterile, free-flowing penicillin preparation. In pneumonia, meningitis, gonorrhea, syphilis, bacterial endocarditis and other infections where penicillin is indicated. **Dose:** As indicated. **Sup.:** In 1.0 cc. disposable cartridge syringes, and in 10 cc. vials.

Vi-Aqua Therapeutic, U. S. Vitamin Corp., New York 17, N. Y. Aqueous therapeutic vitamin formula. **Dose:** One to 2 capsules or more daily as required. **Sup.:** In bottles of 30, 100 and 500 capsules.

Corrigendum

Tensilon Chloride, Hoffmann - LaRoche, Inc., Nutley 10, N. J., was incorrectly listed as Tonsilon Chloride in our October issue. The editors regret this mistake.

when nasal congestion

is most distressing...

At work, at play, at meals—nasal congestion is not only a physical discomfort but also a distinct social handicap.

Yet, at times like these, when your patient strives to put his best foot forward, his use of nose drops is neither practical nor appropriate. Benzedrex Inhaler, on the contrary, is convenient to use . . . and affords instant and prolonged relief.

And your patient will like Benzedrex Inhaler. Its agreeable odor and superior effectiveness—without such side effects as excitation or nervousness—make it *the* Inhaler wherever relief from nasal congestion is indicated.

Recommend Benzedrex Inhaler for use between treatments in your office.

Smith, Kline & French Laboratories, Philadelphia

Benzedrex* Inhaler

the best inhaler ever developed

*T.M. Reg. U.S. Pat. Off.

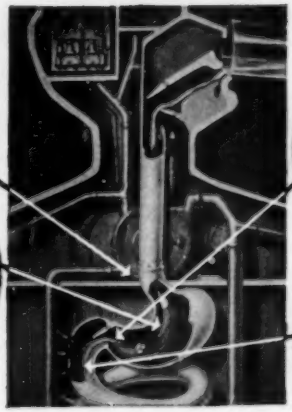
Give faster pain relief with BUFFERIN

ACTS TWICE AS FAST AS ASPIRIN

WITHOUT GASTRIC DISTRESS!

1. BUFFERIN enters the stomach here.

2. BUFFERIN exerts its antacid effect, lessening the possibility of gastric distress.



3. BUFFERIN helps dilate the pyloric valve, promptly leaves the stomach.

4. BUFFERIN's analgesic component is absorbed into the blood *twice as fast as aspirin*, relieves pain.

When you prescribe BUFFERIN to your patients you assure *faster relief of pain*. Clinical studies[1] show that within ten minutes after BUFFERIN is ingested, blood salicylate levels are as great as those attained by aspirin in twice this time. That is why BUFFERIN *acts twice as fast as aspirin*.

BUFFERIN has *greater gastric tolerance*. BUFFERIN's antacid ingredients provide protection against the gastric distress so often seen with aspirin.[1] BUFFERIN, therefore, is especially suited for use when prolonged use of salicylates is indicated.

1. Effect of Buffering Agents on Absorption of Acetylsalicylic Acid J. Am. Pharm. A., Sc. Ed. 39:31, Jan. 1950.

In vials of 12 and 36 and bottles of 100. Scored for divided dosage. Each BUFFERIN tablet contains 5 grains of acetylsalicylic acid with optimal proportions of magnesium carbonate and aluminum glycinate.

BUFFERIN
is a trade-mark of the Bristol-Myers Company

A product of BRISTOL-MYERS COMPANY
19 West 50 St., New York 20, N. Y.

Obesity Management

with regard to physiologic laws

"The obese person's weight can be reduced by . . . curtailing the intake of food . . . judiciously and with regard to physiologic laws. Therefore in restricting the food, precautions should be taken to guard against . . . mineral-vitamin deficiency . . . the distress of great hunger and profound weakness."[1]

1. McLester, J. S.: Nutrition and Diet in Health and Disease, pp. 412-413, 1949.

AM PLUS provides balanced proportions of 8 vitamins and 11 minerals and trace elements to effectively safeguard the obese patient against hazardous nutritional deficiencies which often result from the restricted dietary regimen.

Dextro-Amphetamine Sulfate with 8 Vitamins and 11 Minerals... All in One Capsule

ALL IN ONE CAPSULE

DEXTRO-AMPHETAMINE SULFATE	5 mg.
CALCIUM	242 mg.
COBALT	0.1 mg.
COPPER	1 mg.
IODINE	0.15 mg.
IRON	3.33 mg.
MANGANESE	0.33 mg.
MOLYBDENUM	0.2 mg.
MAGNESIUM	2 mg.
PHOSPHORUS	187 mg.
POTASSIUM	1.7 mg.
ZINC	0.4 mg.
VITAMIN A	5000 U.S.P. Units
VITAMIN D	400 U.S.P. Units
THIAMINE HYDROCHLORIDE	2 mg.
RIBOFLAVIN	2 mg.
PYRIDOXINE HYDROCHLORIDE	0.5 mg.
NIACINAMIDE	20 mg.
ASCORBIC ACID	37.5 mg.
CALCIUM PANTOTHENATE	3 mg.

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SELECTIVE PHYSIOLOGIC DEBRIDEMENT

Tryptar, a dramatic advance in general practice and surgery, for the first time provides SELECTIVE PHYSIOLOGIC DEBRIDEMENT of surfaces covered with necrotic tissue and pyogenic membranes.

Tryptar digests, selectively, only non-viable cells and tissues, and is completely innocuous for living tissue. Debridement of superficial ulcerations with Tryptar is accomplished within hours. Healing of lesions is induced by removal of local obstacles and promotion of the humoral defense mechanisms of the body. When surgery is indicated, Tryptar creates a clean operative field, greatly reducing the surgical risk in conditions inaccessible to antibiotics. Tryptar causes neither local nor antigenic reactions and is non-sensitizing.

INDICATIONS: Varicose ulcers, osteomyelitis, diabetic gangrene, sinuses and fistulae, decubitus ulcers, subcutaneous hematomas, carcinomatous ulcers, soft tissue abscesses, second and third degree burns, empyema and amputation stumps.

SUPPLIED: Tryptar is supplied in One-Million-Unit shelf cartons consisting of 4 vials of Tryptar, each containing 250,000 Armour Units (250 mg.), with 4 vials of Tryptar Diluent. A package containing plastic adapters is supplied for use with powder blowers.

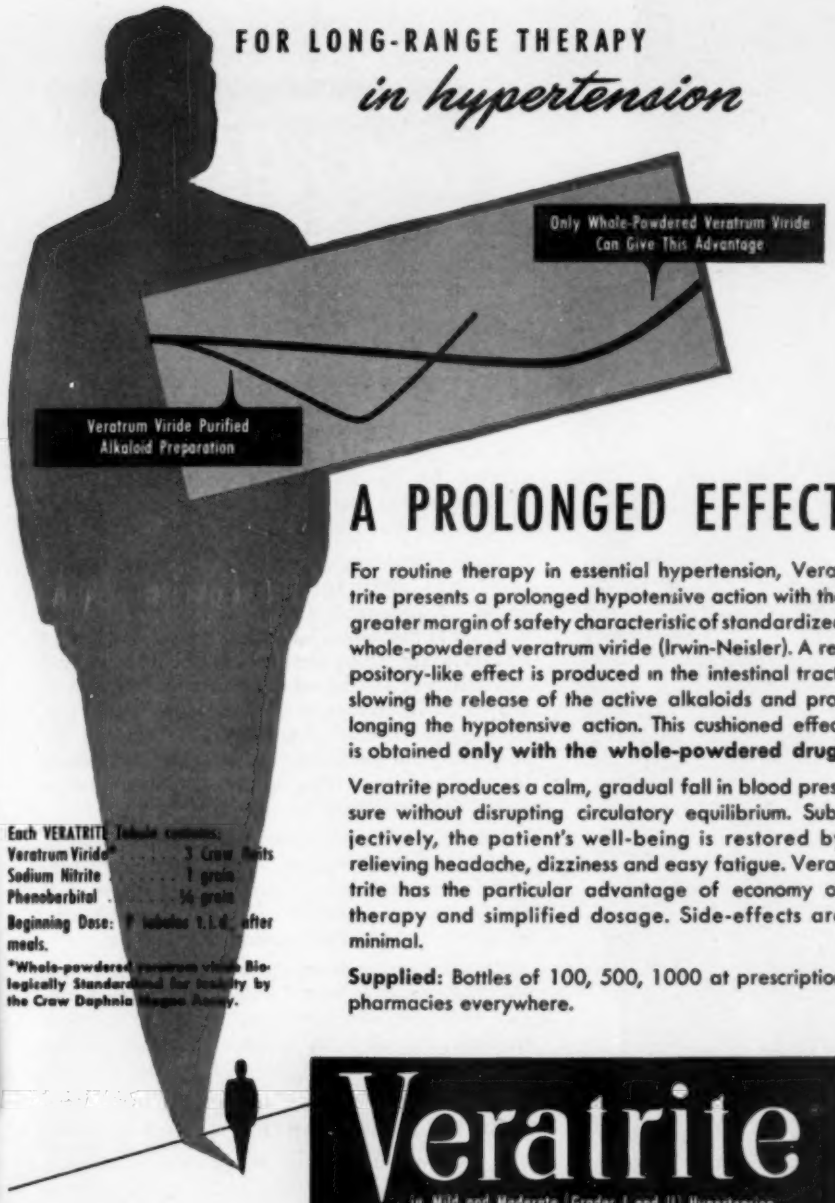
THE ARMOUR LABORATORIES • CHICAGO 11, ILLINOIS

world-wide dependability

PHYSIOLOGIC THERAPEUTICS THROUGH BIORESEARCH

FOR LONG-RANGE THERAPY

in hypertension



A PROLONGED EFFECT

For routine therapy in essential hypertension, Veratrite presents a prolonged hypotensive action with the greater margin of safety characteristic of standardized whole-powdered veratrum viride (Irwin-Neisler). A repository-like effect is produced in the intestinal tract, slowing the release of the active alkaloids and prolonging the hypotensive action. This cushioned effect is obtained **only with the whole-powdered drug.**

Veratrite produces a calm, gradual fall in blood pressure without disrupting circulatory equilibrium. Subjectively, the patient's well-being is restored by relieving headache, dizziness and easy fatigue. Veratrite has the particular advantage of economy of therapy and simplified dosage. Side-effects are minimal.

Supplied: Bottles of 100, 500, 1000 at prescription pharmacies everywhere.

Each VERATRITE Tablet contains:
Veratrum Viride* . . . . . 3 Crow Units
Sodium Nitrite . . . . . 1 grain
Phenobarbital . . . . . ¼ grain
Beginning Dose: 1 tablet t.i.d. after meals.

*Whole-powdered veratrum viride Biologically Standardized for toxicity by the Crow Daphnia Magna Assay.

Veratrite

in Mild and Moderate (Grades I and II) Hypertension

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Research to Serve Your Practice

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VAGINAL GEL

the simple method of contraception used without a diaphragm...

Physicians and patients have long been demanding a simpler contraceptive method than jelly *and* diaphragm.

built on a new base

To replace the function of the diaphragm, a new and better physical barrier, incorporated into the Gel itself, was needed — one that could be depended on to cover the cervical os effectively. The new base of PRECEPTIN, achieved by blending recently developed synthetic gel-forming agents, meets this requirement, making it possible to do away with the diaphragm.

clinically proved

Of 3270 patients using Preceptin Gel — 99.2 percent received complete protection.

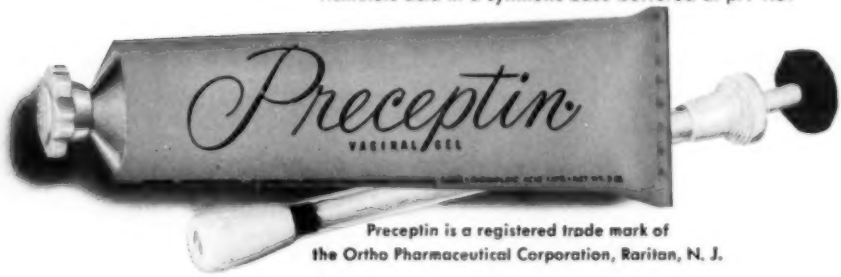
Preceptin's new base:

1. **adheres well to the moist cervical mucosa — forms a persistent, adherent physico-chemical barrier over the cervical os.**
2. **is more miscible with semen — means greater spermicidal potency.**
3. **rapidly releases active spermicides — enables Preceptin to kill sperm on contact.**

Preceptin Vaginal Gel

Used with measured-dose applicator.

COMPOSITION: PRECEPTIN contains the active spermicidal agents p-Diisobutylphenoxypolyethoxyethanol and ricinoleic acid in a synthetic base buffered at pH 4.5.



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Ventral Hernias

Their Repair with the Use of Tantalum Mesh Gauze

GEORGE BRADLEY McNEELY, B.S., M.D.
Bloomington, Ill.

Probably one of the most distressing of postoperative complications is the ventral hernia. These hernias generally occur in obese individuals and the problem of repair is a difficult one to decide. The experience of the past has been generally a series of recurrences as these patients do not seem to have fascia that lends itself to repair.

Various techniques and materials have been used to reinforce fascia. The use of metal grids, plates, mesh, fascia lata, cutis grafts, etc., is not new in this field of surgery.

As early as 1894 Phelps used coiled silver wire. Witzel (1900) used crossed silver wire. Goepel (1900) used a ready-made silver filigree. Meyer (1902) used a silver wire netting constructed to resemble an ordinary mosquito bar. Bartlett (1903) used a filigree of silver wire loops that was held in position by a central strand. Loewe (1913) reported the use of cutis grafts. Rehn (1914) reported his use of cutis grafts in approximately one hundred cases.

The outstanding difficulty in the use of a foreign body reinforcement has been rigidity. Pliability is necessary so that the implant shall at all times and in all positions yield to bodily movements. I believe tantalum mesh gauze is the most satisfactory foreign body reinforcement available. Tantalum is an element and chemically it approaches glass in resistance to acids and alkalis. It possesses high tensile strength, ductility, and malleability. It becomes work-hardened at a slower rate and has a high degree of tissue acceptability. In soft tissue the cellular response causes firm adhesion of the tissues to the tantalum. Toxic dissolution products are not encountered as it is insoluble in tissue fluids and electrolytic action in body fluids is reduced to a minimum. The tantalum gauze product used consists of wire, 0.003 inch in diameter, that is woven into a 50 by 50 mesh. Each sheet of gauze measured 6 by 12 inches. (Figure No. 1)

Case No. 347-1955

A 40-year-old white female entered the hospital on January 24, 1950.

Family History Father died, 1948, age 74, cerebral hemorrhage. Mother living and well, age 72. Sisters (4) living and well, ages 51, 49, 45, and 38. Brothers (2) died, age 10 months, pneumonia; died, age 26, heart disease.

Past History *Surgical* — Tonsillectomy

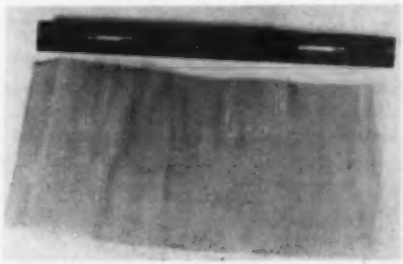

Fig. 1. Commercial product of tantalum gauze (Ethicon) consisting of wire 0.003 inches in aperture diameter woven into a 50 by 50 mesh. The sheet measures 6 by 12 inches.

and adenoidectomy, 1920. Appendectomy, 1931. Exploratory laparotomy for adhesions, 1937. Cholecystectomy, 1947. Total hysterectomy, 1948.

Obstetrical—Gravida 0, para 0.

Medical—Colitis, 1940.

Menstrual—Onset—16 years. Cycle—21 days. Period—3-5 days with no dysmenorrhea.

Chief Complaint Painful swelling of the entire right lower quadrant of the abdomen. 12 months.

Onset and Course The patient states that for approximately one year she has experienced discomfort in the right lower quadrant of the abdomen on exertion. The protrusion and pain have become worse during the past six months. During the last thirty days before entering the hospital she has been unable to accomplish her housework because of the painful protrusion of the lower right abdominal wall.

Physical Examination The physical examination reveals a 40-year-old white female who is approximately one hundred pounds overweight.

Head and Neck—Eyes, ears, nose, mouth and throat are all essentially negative.

Chest—Inspection, palpation, percussion and auscultation are all essentially negative.

Heart—Borders: Within normal limits. Rate: 80. Rhythm: Regular, Murmurs: None.

Lumbar Areas—Normal.

Abdomen—Inspection: There is an old surgical scar in the upper right quadrant (chlolecystectomy) that is well healed. There is an old surgical scar in the midline from pubic ramus to the umbilicus (hysterectomy) that is well healed. There is a bulging mass approximately ten centimeters in diameter in the lower right quadrant. This mass becomes larger on exertion.

Palpation: There seems to be three areas within the circumference of the mass in which circular defects can be palpated.

Percussion: Essentially negative.

Auscultation: Essentially negative.

Vaginal Examination—The total uterus has been removed. All other findings are normal.

Rectal Examination—Normal.

Extremities—Upper: Normal. Lower. Normal.

Laboratory Reports—Blood Count:

R. B. C. 4,870,000
W. B. C. 12,100
Hb. 15.8 gm.
C. I. 1.03
Clotting Time 2 min.
Hematocrit 46
Schilling: Eosins. 3
Segs. 57
Lymphs. 40
Blood Chemistry: N. P. N. 27
Blood Kahn: Negative
Blood Type: Type A, Rh Positive
Urinalysis: Color—Yellow
Character—Cloudy
Reaction—pH 5
S. G.—1.020
W. B. C.—Many
All other findings negative.

Surgical Procedure

Preoperative Diagonsis Multiple ventral hernias, right lower quadrant of abdomen.

Anesthetic Sodium Pentothal induction and ether maintenance.

Operative Technique A Pfannenstiel incision over the protruding mass and approximately fifteen centimeters in length was accomplished. The upper and lower skin flaps were dissected free leaving as much fat layer as possible attached. The fascia contained three distinct defects that varied in diameter from three to six centimeters. There was no fascia present in these circular openings. The peritoneal layer of each sac was opened. The omentum and small intestines were returned to the peritoneal cavity and each

sac was closed with a series of fine, silk, purse-string sutures. Each suture row was placed to bury the preceding row. The fascia borders of each defect were then approximated with interrupted medium silk sutures using the mattress technique. A twenty by twenty centimeters square of tantalum wire screen, fifty by fifty mesh, was then placed over the entire operative field. The four corners of the screen were firmly attached to the fascia with medium silk sutures. Interrupted medium silk sutures were placed at three-centimeter intervals around all four sides of the screen. Four silk sutures attached the screen at the four poles of each of the three repaired hernia areas. The skin wound was approximated with metal clips.

Hospital Progress 1/25/50 Returned to room following surgery in good general condition. Pulse 100. Respiration 20.

1/26/50 First postoperative day. T. 98.6. P. 88. R. 20. Complained of nausea but general condition good.

1/27/50 Second postoperative day. T. 99.6 P. 88. R. 20. Eating light diet.

1/28/50 Third postoperative day. T. 100. P. 92. R. 20. Eating general diet. General condition good.

2/3/50 Ninth postoperative day. T. 98. P. 84. R. 20. Eating well and has no complaints. Skin clips removed.

2/8/50 Fourteenth postoperative day. Discharged as ambulatory.

The patient recovered completely. She was able to do all her household duties without any apparent discomfort. During April, 1950 the patient developed a severe upper respiratory infection that was complicated with coughing spasms. During one of these paroxysms of coughing she experienced acute, midline, lower abdominal pain. Following this she developed a swelling in the old midline surgical scar approximately five centimeters above the the symphysis pubis. The patient was hospitalized again on May 9th, 1950.

Preoperative Diagnosis Postoperative hernia.

Anesthetic Pentothal induction with nitrous oxide and oxygen mixture.

Operative Technique A transverse incision of approximately twenty centimeters was accomplished. The line of the skin incision was placed three centimeters above the upper hernia border. The upper skin flap was dissected free for approximately six centimeters. The lower skin flap was dissected free down to and above the symphysis pubis. All bleeding was controlled by clamping, dividing, and ligating blood vessels as encountered. After the lower skin flap was retracted the hernia was exposed. The hernia occurred in the midline at the linea alba approximately six centimeters superior to the upper border of the symphysis pubis. The diameter of the circular opening in the fascia was approximately five centimeters and there was no fascia covering the defect. The peritoneal lining of the sac was opened. The small intestine and omentum were returned to the peritoneal cavity and the hernia sac was closed with a series of fine silk, purse-string sutures. Each layer of suture was so placed as to bury the preceding suture row. The fascia borders of the hernia defect in the linea alba were then approximated with interrupted medium silk sutures using the mattress technique. A fifteen by twenty centimeter tantalum wire screen, fifty by fifty mesh, was then placed over the entire operative area. The four corners of the screen were then firmly attached to the fascia with medium silk sutures. Interrupted medium silk sutures were used to secure the screen at three-centimeter intervals on the four sides. In addition four silk sutures attached the screen at the four poles of the repaired hernia area. The screen was thereby firmly attached to the fascia and was so placed that the repaired hernia area was equidistant from all borders of the screen. The skin wound was closed with metal clips.

Pathological Conclusions *Gross:* A roentgenogram of the abdomen in the

PA projection reveals multiple skin clips running transversely in the lower abdomen at the site of the Pfannenstiel incision. Semi-opaque material is seen in the lower abdominal wall at the midline and in the lower right quadrant. Two separate areas of this material are revealed. (Figure No. 2)

Microscopic: None.

Diagnosis: Ventral hernia.

Hospital Progress 5/11/50 T. 98.6. P. 80. R. 24. First postoperative day. The patient enjoyed a soft diet but complained of pain in operative area.

5/12/50 T. 98.4. P. 80. R. 22. Second postoperative day. Patient has no complaints. Eating well and has good bowel function.

5/15/50 T. 98. P. 88. R. 22. Fifth postoperative day. Complains of pain in lower incision. There is a small area in the lower incision that is raised and red. Patient eating well.

5/16/50 T. 99. P. 86. R. 24. Sixth postoperative day. Red, raised area in lower incision is not painful today and seems to be subsiding. Patient up in chair today.

5/17/50 T. 98. P. 80. R. 20. Seventh postoperative day. Skin clips removed. Patient eating well and up walking about room.

5/21/50 Eleventh postoperative day. Discharged from hospital as ambulatory.

Office Progress 9/1/50 Three and one half months after leaving the hospital the patient was examined in my office and there was no evidence of a hernia.

Case No. 2523

A 51-year-old white female who entered the hospital on June 12, 1950.

Family History Father, age 79, living and well. Mother, age 75, living and well. Brothers, age 50, living and well; 48, living and well; 40, living and well; 30, living and well. Sisters, age 35, living and well; 45, living and well.

Past History *Surgical*—Total hysterectomy January 4, 1950.

Obstetrical—Gravida—0. Para—0.

Medical—Usual childhood diseases with good recovery.

Menstrual—Onset—14 years. Cycle—29 days. Period—3-7 days with no dysmenorrhea.

Chief Complaint Bulging mass in lower abdomen just above the symphysis pubis especially on exertion—3 weeks.

Onset and Course The patient states that approximately three weeks before hospital entrance she developed an acute upper respiratory infection in which she experienced several paroxysms of coughing. During one of these attacks of coughing she felt something "give" in the lower abdomen. Approximately twenty-four hours later the patient noticed a bulging in the midline, lower abdomen, above the symphysis pubis.

Physical Examination The physical examination reveals a 40-year-old white female who is approximately seventy-five pounds overweight.

Head and Neck — Eyes, ears, nose, mouth and throat are all essentially negative.

Chest — Inspection, palpation, percussion and auscultation are all essentially negative.

Heart—Borders: Normal Limit. Rate: 72. Rhythm: Regular. Murmurs: None.

Lumbar Areas—Essentially negative.

Abdomen—Inspection: There is an area of bulging, especially on exertion, in the midline beginning at the symphysis pubis and extending upward for a distance of ten centimeters.

Palpation—Manual pressure causes the mass to be reduced. After reduction a circular defect can be defined that measures approximately five centimeters in diameter.

Percussion—Negative.

Auscultation—Negative.

Vaginal Examination — Introitus: Admits two fingers. Bartholin's, Skene's, and urethra are negative. The cervix, body,

and fundus of the uterus are missing. Adnexa—Negative.

Rectal Examination—Negative.

Extremities—Upper: Negative. Lower: Negative.

Laboratory Reports—Blood Kahn: Negative.

Blood Count:

R. B. C. 4,220,000
W. B. C. 9,500
Hb. 14.4 grams
C. I. 1.2
Schilling: Segs. 69
Lymphs. 30
Monos. 1
Clotting Time: 4 min.
Bleeding Time: 22 sec.
Hematocrit: 42

Urinalysis: Color—Yellow
Character—Cloudy
Reaction—pH 5
S. G. 1.010
Alb.—Trace
W. B. C.—Many
R. B. C.—None

Surgical Procedure

Preoperative Diagnosis Postoperative ventral hernia.

Anesthetic Drop ether.

Operative Technique A midline incision over the large mass was accomplished. The skin flaps including subcutaneous fat were dissected free from the incision line for a distance of six centimeters on both sides. All bleeding was controlled by clamping, dividing, and ligating as blood vessels were encountered. After the skin flaps were retracted the hernia was exposed. The hernia occurred in the midline at the linea alba and occupied a space beginning at the symphysis pubis extending ten centimeters upward on the abdomen. The diameter of the circular fascia defect was approximately six centimeters and there was no fascia covering this opening. The peritoneal covering of the protruding sac was opened. The small intestine and omentum were returned to the peritoneal cavity. The hernia sac was then closed with a series of fine purse-string sutures. Each suture row was so placed as to bury the preceding row. The fascia borders were approximated with interrupted medium silk sutures using the mattress technique. A fifteen by ten centimeter, rectangular, tantalum wire screen, fifty by fifty mesh, was then placed over the entire operative area. The four corners of the screen were attached to the fascia with medium silk sutures. Interrupted medium silk sutures placed at three centimeter intervals around the four sides provided additional security. Four medium silk sutures were placed in the long axis at the mid-portion of the screen and over the repaired fascia suture row. The screen was thereby firmly attached to the fascia and was so placed that the repaired hernia area was of equal distance from its borders. Four stainless

Fig. 2. Case No. 347-1955. Roentgenogram of abdomen in posterior-anterior projection revealing the two tantalum mesh gauze placements. The upper right gauze has been in place for four months. The lower screen has been in place for six days.

steel wire No. 32 tension sutures were inserted through the skin and down to the fascia. The skin wound was closed with metal clips and the tension sutures secured with Davy buttons.

Pathological Conclusions *Gross:* A roentgenogram of the abdomen in the PA projection reveals a tantalum wire mesh screen in the left lower abdomen at the site of the repair. (Figure No. 3)

Microscopic: None.

Diagnosis: Ventral Hernia (postoperative).

Hospital Progress 6/13/50 Patient returned from surgery in good condition. P. 72. R. 16.

6/14/50 T. 98.6. P. 72. R. 20. Patient eating regular diet and has no complaints.

6/15/50 Second postoperative day. T. 99.2. P. 88. R. 20. Eating general diet and drinking all fluids. Has no complaints.

6/23/50 Eleventh postoperative day. T. 98.6. P. 76. R. 24. Tension sutures and skin clips removed.

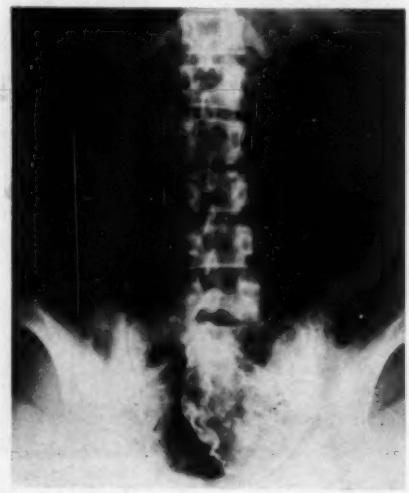

Fig. 3. Case No. 2523. Roentgenogram of abdomen in posterior-anterior projection revealing tantalum mesh gauze in position thirteen days after surgery.

6/24/50 Twelfth postoperative day. Patient up in chair.

6/25/50 Thirteenth postoperative day. Patient up and about.

6/26/50 Discharged from hospital as ambulatory.

Office Progress 8/7/50 Five weeks after leaving the hospital I examined the patient in my office. After a complete physical examination there is no evidence of a hernia at this time.

10/30/50 Patient has no complaints and there is no evidence of a hernia at this time.

Case No. 3871

A 45-year-old white female entered the hospital on September 7, 1950.

Family History Father died age 59, accident. Mother died age 63, coronary heart disease. Sisters—one, died in infancy. Brothers—one, living and well.

Past History *Surgical*—None.

Obstetrical—Gravida VI. Para VI.

Medical—None.

Menstrual—Onset at age 11. Cycle—irregular. Period—irregular.

Chief Complaint Swelling of abdomen upper right quadrant which becomes accentuated on exertion—15 years.

Onset and Course Approximately fifteen years before hospital entrance the patient noticed a swelling in the upper right quadrant of the abdomen. This swelling gradually became larger. For the last three years she has complained of intermittent pain over the enlargement. During the attacks of pain she also experienced nausea and vomiting. The swelling has enlarged until it occupies the entire right upper quadrant of the abdomen.

Physical Examination The physical examination reveals a 45-year-old white female who does not appear acutely ill and is approximately 150 pounds overweight. Her present weight is 308 pounds and her height is five feet and four inches.

Head and Neck—Eyes, ears, nose,

throat and neck are all essentially negative.

Chest — Inspection, palpation, percussion and asucultation are all essentially negative.

Heart—Borders: Within normal limits. Rate: 84. Rhythm: Regular. Murmurs: None.

Lumbar Areas—Essentially negative.

Abdomen—Inspection: There is a basket-ball sized mass in the right upper quadrant.

Palpation: The mass can easily be outlined and it occupies the entire upper right quadrant.

Percussion: Negative.

Auscultation: Hypertonic bowel sounds present in area of the mass.

Vaginal Examination—Introitus admits three fingers. Bartholin's glands—Negative. Skene's glands—Negative. Urethra—Negative. Cervix—Normal. Fundus—Normal. Adnexa—No masses.

Rectal Examination—Essentially negative.

Extremities—Essentially negative.

Laboratory Reports—Blood Count

R. B. C. 4,350,000
W. B. C. 9,700
Hb. 14.8 grams
C. I. 1.0
Clotting Time 3 min.
Bleeding Time 20 sec.
Hematocrit 43
Schilling: Eosins. 1
Segs. 60
Lymphs. 39
Blood Kahn: Negative.
Urinalysis: Color—Straw
Character—Turbid
Reaction—pH 6
S. G. 1.011
Albumin—Negative
Sugar—Negative
Microscopic—Negative

Surgical Procedure

Preoperative Diagnosis Ventral hernia, large, upper right quadrant of abdomen.

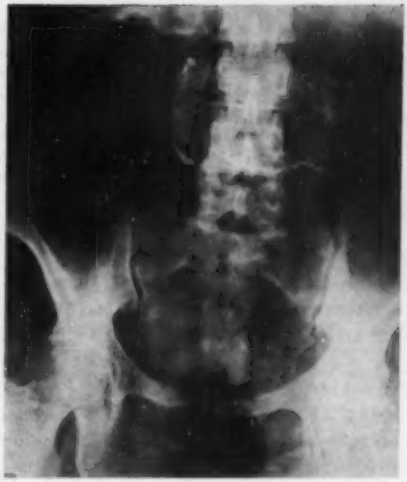

Fig. 4. Case No. 3871. Roentgenogram of the abdomen in posterior-anterior projection revealing tantalum mesh gauze in place twelve days following surgery.

Anesthetic Drop ether.

Operative Technique A transverse incision of approximately thirty centimeters was accomplished. The skin incision was so placed as to bisect the center of the circular hernia area. The upper skin flap, including a ten centimeter layer of subcutaneous fat, was dissected upward from the incision line for a distance of ten centimeters. The lower skin flap, including a ten centimeter layer of subcutaneous fat, was dissected downward from the incision line for a distance of ten centimeters. All bleeding was controlled by clamping, dividing, and ligating as encountered. The hernia was identified, exposed, and found to be approximately twenty centimeters in diameter. Great difficulty was experienced in isolating the hernia sac due to the large number of adhesions between the sac walls and surrounding tissue. After the borders and sac were completely isolated the hernia was

found emerging from a half dollar size aperture in the fascia. The peritoneal sac was opened. Several loops of small intestine and a large amount of omentum were packed closely within the confines of the sac. Great difficulty was experienced in replacing the contents into the peritoneal cavity due to adhesions between the omentum and sac wall. Additional difficulty was encountered due to the small diameter of the aperture in the fascia. There was a large amount of redundant sac remaining and this was removed after closure of the sac neck with a purse-string suture of double "O" chromic. A series of purse-string sutures of double "O" chromic, each so placed as to bury the preceding row, were used to reduce the defect as much as possible. The borders of the fascia opening were then approximated with interrupted medium silk sutures using the mattress technique. A 15 by 20 centimeters, rectangular, tantalum wire screen, 50 by 50 mesh, was placed on the fascia and the four corners were secured with medium silk sutures. Medium silk sutures placed at three-centimeter intervals attached the four sides of the screen to the fascia. In addition seven medium silk sutures secured the screen to the repaired fascia opening. The screen was thereby firmly attached to the fascia and so placed that the repaired fascia area was equidistant from all borders of the screen. Four tension sutures of No. 30 stainless steel wire were inserted through the skin and secured with Davy buttons. The skin wound was closed with metal clips.

Pathological Conclusions *Gross:* A roentgenogram of the abdomen in the PA projection reveals a tantalum wire mesh projected in the plane of the mid-abdomen. The tantalum wire mesh was utilized in the repair of the ventral hernia. (Figure No. 4)

Microscopic: None.

Diagnosis: Ventral hernia.

Hospital Progress 9/8/50 Patient returned from surgery in good general condition. Pulse was 120 and of good quality. Respirations were 26.

9/9/50 First postoperative day and patient enjoyed a liquid diet. Complains of burning pain in operative area. T. 99.8. P. 104. R. 24.

9/10/50 T. 99.4. P. 108. R. 20. On second postoperative day the patient developed an acute upper respiratory infection. Penicillin S-R 800,000 units per hypodermic every six hours and Pyribenzamine mg. 50 every six hours were administered for the infection.

9/11/50 T. 99.8. P. 112. R. 28. The third postoperative day. The patient is eating a soft diet and has no surgical complaints. The upper respiratory infection has caused discomfort due to profuse diaphoresis and coughing.

9/12/50 T. 98. P. 84. R. 20. The fourth postoperative day and the patient is moving about in bed with ease. The upper respiratory infection is less prominent today. She states she has no complaints.

9/13/50 T. 98.6. P. 84. R. 20. The fifth postoperative day and patient sat up on side of bed. Upper respiratory infection very much improved.

9/14/50 T. 99. P. 80. R. 20. The sixth postoperative day and patient eating a general diet. She has no complaints and all symptoms of the upper respiratory infection are gone.

9/18/50 T. 98.8. P. 88. R. 24. The ninth postoperative day. The steel tension sutures and metal skin clips were removed. The surgical wound is well healed and patient does not notice any discomfort in the operative area.

9/19/50 T. 98.4. P. 84. R. 24. The tenth postoperative day and patient sat up in a chair.

9/22/50 T. 98.4. P. 80. R. 24. The thirteenth postoperative day and patient is up walking about the room.

9/25/50 T. 98.6. P. 72. R. 20. The sixteenth postoperative day and the patient

was discharged from the hospital as ambulatory.

Office Progress 11/1/50 Five weeks after leaving the hospital the patient called at my office. After a complete physical examination there is no evidence of a hernia at this time. The patient states that she experiences an occasional burning pain in the operative area.

Conclusion Summary

This series of cases demonstrates the use of tantalum wire mesh as an aid in the repair of ventral hernias. Postoperative ventral hernias, recurring ventral hernias, or ventral hernias in obese patients present a common problem in that the fascia is either insufficient, has poor healing properties, or its tensile strength is inadequate. Failures after repair of these hernias can often be traced to the difficulty experienced by the surgeon in adequately constructing a wall to withstand pressure. If he has an inadequate supply of fascia the approximated borders will not remain apposed or longitudinal strata of fascia will widen lateral to either side of the reconstruction. This is especially a problem where the surgeon feels overlapping technique is indicated. Therefore, it follows, if he can approximate the borders of the fascia without too much tension, knowing he has an additional layer of tissue (tantalum mesh) which will overlap not only the reconstructed area but the surrounding fascia as well, the end result will be a stronger wall. The square apertures in the screen offer space for the passage of fibrous tissue and therefore, additional strength to the retention wall.

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1948.

323-27 Unity Bldg.

Medical Progress Helps Cut Orphan Problem of Nation

Medical progress has cut the potential orphan problem of the nation in half since 1900, according to the *Journal of* the *American Medical Association.*

"Although 371,000 children under 18 became orphaned by the death of a parent in 1948, the toll would have been twice that with the death rates of 1900," *The Journal* said editorially in a recent issue.

"Likewise, the number of marriages broken by the death of husband or wife would have been close to one million, 50 per cent greater than the number reported, 667,000.

"Chronologically, the process starts at birth with keeping both mother and newborn baby alive. The probability of a child's being orphaned at birth today is only one-eighth to one-seventh the probability that its mother would have been left motherless at birth a generation ago. Thus medical progress and longer life are increasing family stability in a period when many families are being broken for reasons other than the death of a parent."

In 1948, there were 91,000 minor children orphaned by deaths of fathers under age 45; 82,000 by deaths of fathers between 45 and 55, and 67,000 by deaths of fathers 55 and over. The *Journal* added:

"These figures clearly indicate that the majority of orphans are created by the deaths of middle-aged fathers; the child dependency problem is not so acute for the widow, since many of these children are not far from the age when they may become gainfully employed."

The editorial also pointed out that communities, likewise, benefit by being relieved from the burden of supporting thousands of indigent widows and orphans.

SPECIAL ARTICLE

Low Back Pain

Part I: Ruptured Intervertebral Disc

This summarization attempts to cover the essential information on the subject, including therapy, and is designed as a time-saving refresher for the busy practitioner.

Along with headache, low back pain (L B P) is one of the commonest and most troublesome problems for the doctor. Not alone the general practitioner is troubled. L B P offers diagnostic and therapeutic problems to learned members of several specialties. Scholars in the basic sciences of physiology, anatomy, embryology and pathology are struggling with fundamental questions, the answers to which will assist us to deal more confidently with the question: "Doctor, what makes me have lumbago?"

Unfortunately there are still a few doctors who make no satisfactory attempt to reach a conclusive etiologic diagnosis. In the press of a busy office practice, they learn that rest, salicylates and physiotherapy will relieve most L B P. The judicious use of adhesive strapping and the occasional prescription of a leather or padded metal support are further helpful measures. For the very few patients with L B P who are unrelieved by such routines, these doctors go a little further; either they buckle down and really study the case or they refer the patient to a specialist.

As we shall see later in this review. A careful preliminary study is absolutely indispensable even if we are to know which specialty is concerned by the L B P of a particular patient. Orthopedic L B P includes numerous entities which the general practitioner sees, recoghizes and treats successfully every day. Urologic, gynecologic, neurosurgical and other types of L B P are also not always referral problems. Treatment is usually of such nature that the general man can handle the case satisfactorily. The important question is diagnosis. Whereas the general practitioner can usually provide adequate care, he is not always prepared to give adequate time to the problem of differential diagnosis. He does not always have full realization of the great array of possibilities. Sometimes he also lacks necessary diagnostic laboratory facilities.

The first section of this review deals with intervertebral disc syndrome. In 60% of patients with clinically significant ruptured intervertebral discs, sciatica is the major complaint. About 70% of disc patients state, however, that L B P preceded sciatica. When evidence of neurologic changes is superimposed upon the complaint of L B P, intervertebral disc involvement must be considered.

A. Illustrative Case

A well developed man of 35 bent over to lift a trunk. His knees were straight.

As his arms raised the trunk from the floor, he noted a sharp L B P. With determined vigor, the man pursued his work, carrying the trunk a short distance. Again on setting down the burden, he noted lancinating L B P. A dull ache remained all that day. It was temporarily worse first thing the next morning. Thereafter he could forget it except when rising out of a chair or sitting down. In a few days the symptoms subsided. Alleviation was not achieved without his having noted that sneezing and straining at the stool aggravated his pain. It was definitely worse in the erect than in the prone or supine position.

Repeated episodes occurred in the following six months. Each seemed to be related to: (1) a fall on his heels when he missed a step in the dark (2) an extraordinary day of standing for many hours at a time at a business convention, studying exhibits (3) several times when lifting objects of from 30 to 100 pounds in the same way that he had lifted the trunk.

After packing the family car and trailer with boxes, suitcases and furniture, the man drove the family out to their summer home. The following day he sought medical advice. He explained that during the drive the previous day he suffered numbness and dull pain in the right buttock and down the back of the right thigh into the leg. Thereafter his back was stiff.

Examination disclosed marked spasticity of lumbar musculature. Kyphosis replaced normal lumbar lordosis. Bending was limited in all directions because of pain and muscle spasm. Percussion over the lower lumbar spines was very painful. Deep palpation to the right of these spines produced sciatic radiation of the pain.

Dorsiflexion of the right ankle caused slight mid-lumbosacral pain with radiation to the right fifth lumbar interspace. When

Fig. 1. Anatomical drawing of the lumbar region of the spinal cord showing the position of the sciatic nerve in relation to the vertebrae.

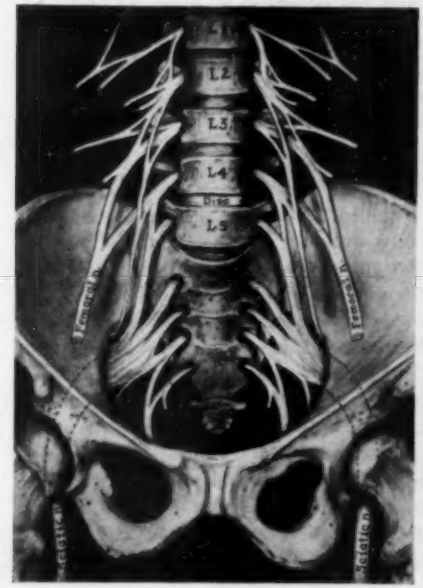


Fig. 2. Anatomical drawing showing the relation of the sciatic nerve to the muscle of the right thigh (after Spalteholz).

the right thigh was flexed at the hip with the right knee extended, pain commenced at fifteen degrees rise from the horizontal. The pain ran from the right hip toward the sciatic notch and into the lower back. This pain was relieved by flexion at the knee. Similarly raising the left leg with the knee extended produced L B P at 30 degrees. Radiation of this pain occurred into the right hip. Similar pain was produced when the patient forcefully flexed his neck on his chest and by jugular compression.

The right calf was tender to pressure. The knee jerks were equal. The right ankle jerk was absent and the left was normal. Hyperesthesia to pin prick, heat and cold was distributed on the right in the perianal area, mid-posterior thigh, lateral leg and the dorsum of the great toe and foot. It was easier to oppose dorsiflexion of the right than the left great toe.

Immediate sedation and bed rest were advised. The man agreed to hospitalization and was admitted with the diagnosis of protruded intervertebral disc (I/D) at the fourth lumbar interspace on the left. The level was decided on the basis of apparent involvement of the fifth lumbar nerve which would be caught by an L4 disc protrusion.

Bed rest, sedation and the use of muscle relaxant medication failed to produce satisfactory relief. The man complained not at all but he suffered severely. Simple tests of his ability to withstand pain were tried and he proved very stoical.

Plain roentgenograms of the lumbar spine showed narrowing of the disc space between L 4 and L 5 together with osteophytes located posteriorly. The adjacent plates of the bodies of L 4 and L 5 were sclerosed. Kyphosis of the lumbar spine was revealed in the lateral view. No congenital defects were noted. Inflammatory and neoplastic diseases of the spine were excluded. It seemed safe to abide by the presumptive diagnosis. The patient was offered a continuation of conservative treatment. Heat in any form seemed to worsen the pain. Massage was unbearable. A skilled physiotherapist declared the patient to be willing and cooperative, but no relief was obtained by exercises or special posturing. Curare, administered under the supervision of the anesthetist, finally alleviated the muscle spasm and attendant pain.

Several weeks of conservative therapy were not lightly to be considered because of the high cost of hospitalization. Nevertheless, the patient agreed to this trial with the understanding that surgery might thus be rendered unnecessary. Several consultants examined the patient three weeks after his admission and found essentially the same clinical manifestations as are recorded above. One of them predicted that surgery alone would relieve the patient.

With the enthusiastic approval of the patient, myelography was ordered. The radiologist inserted the needle under fluoroscopic control and injected 5 cc. of pantopaque. He tilted the table back and forth with the patient in an extended prone position and with the needle remaining in the subarachnoid space. Thereby, the entire lumbar section of the dural sac was studied for abnormalities. No evidence of neoplasm was encountered. Radioscopic and radiographic evidence of a large posterolateral disc protrusion at L 4 was obtained. Thereafter the radiologist carefully withdrew all the pantopaque by pooling it about the needle visually under fluoroscopy.

At the end of a month of unsatisfactory conservative treatment, the patient consented to surgical removal of the diseased disc. A large tear in the annulus had permitted right posterolateral extrusion of nucleus pulposus material with pressure on the right fifth lumbar nerve root. The extruded material was removed. The interior of the disc was explored with suitable instruments to remove as much

nuclear material as possible. The exposure had been extradural with removal of the fourth lumbar spine and the lamina on the right. Before closing, the left side was now explored for the following reasons. Clinical examination disclosed a few features suggestive of bilateral disc. Observations at surgery showed adhesions on the right. If adhesions were present on the left and remained undivided, symptoms might persist and require a second exploration. Minor adhesions were present on the left and were relieved.

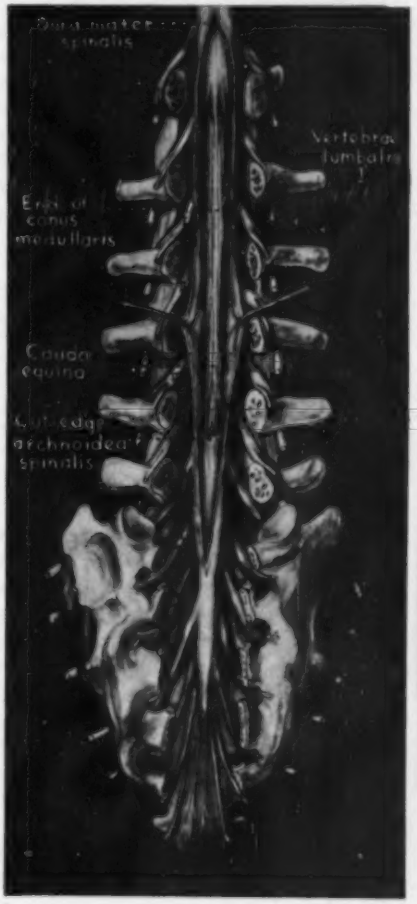
The patient moved about freely in bed on the day following surgery. Opiates were discontinued on the third postoperative day. Thereafter aspirin and codeine were sufficient. No sciatic pain was noted at any time after surgery. Gentle leg exercises were begun during the first week in bed. On the ninth postoperative day the patient took to a wheelchair. Three days later he left the hospital in the wheelchair.

This patient continued as a semi-invalid for a full month after surgery. Thereafter he returned to his work, with admonitions against various forms of exercise including bending over with the knees in extension and any form of lifting including digging. A check-up examination in six months was very satisfactory. The patient proclaimed complete relief of all symptoms. All limitations on physical activity were thereupon removed and the patient has remained symptom free for several years.

B. Anatomy and Physiology

1. Sciatic Nerve Ruptured intervertebral disc (I/D) is reputed to cause 90% of severe recurrent, persistent sciatica.[34] The sciatic nerve is the longest and largest in the body. This nerve consists of the medial and lateral popliteals with fibers derived from L4, L5 S1, S2 and S3. The sciatic nerve leaves the pelvis through the greater sciatic foramen and enters the buttock. A line may be drawn between the posterior superior iliac spine and the ischial tuberosity. A point two-thirds up on this line would approximate the position of entrance of the sciatic nerve into the gluteal region. From there, the nerve runs to a point midway between the ischial tuberosity and the greater trochanter. The location in the thigh is posterior. The sciatic nerve enters the thigh under cover of the lateral border of the biceps. Its course corresponds to a line

Fig. 3. Anatomical drawing of membranes in the vertebral canal to show pathways of pantopaque during myelographyg. (after Spalteholz).



from midway between the ischial tuberosity and the greater trochanter to the center of the popliteal fossa. In sciatica there is often tenderness along the course of the sciatic nerve as here described.

2. Spinal Column The average spine is about 65 cm. long and consists of 33 vertebrae bound together by strong ligaments. The vertebral bodies are separated by 23 intervertebral discs which constitute one fourth the length of the spine.

The vertebral canal of the lumbar region is triangular. Anteriorly, the canal is limited by the vertebral bodies and discs. Laterally are the pedicles of the vertebrae, the intervertebral foramina and the posterior articulating facets. Posteriorly are laminae, spinous processes and the ligamenta flava. With the patient lying prone, the base of the triangular vertebral canal is down. The base is slightly concave and removal of radiopaque media after myelography is facilitated if the needle has been inserted exactly in the midline. This can best be accomplished under direct fluoroscopic vision.

Each vertebra articulates with segments above and below by paired articular facets on processes springing from the point of junction of the pedicles and laminae. The facets guide the movements of the lumbar vertebral bodies. They do not function in weight-bearing.

Spinal nerves and vessels traverse the intervertebral foramina. The boundaries of these foramina are: anteriorly, parts of the bodies and discs; superiorly and inferiorly pedicles; posteriorly, ligamenta flava and articular processes. It should be remembered that alteration of any one of the structures bordering on the foramen may produce nerve compression and neurologic signs suggestive of disc protrusion. Hypertrophy of the ligamentum flavum has been repeatedly suggested as an alternative cause of I/D syndrome. It is likely to produce a more symmetrical, bilateral involvement.

The epidural space, between the inner margins of the vertebral canal and the meninges, is occupied by meningeal nerves, fat and a venous plexus. Varices of the venous plexus are a possible cause of myelographic deformities. Jugular compression permits distention of the epidural veins. This reduces the available space in the bone-enclosed vertebral canal. Consequently there may be greater pressure on an already compressed nerve root. This explains the positive jugular compression test in I/D syndrome.

The nerve roots of the cauda equina lie parallel in the subarachnoid space. A short distance above its exit each nerve becomes intimately attached to the lateral wall of the dural sheath. An evagination of the subarachnoid space occurs at the point of exit of each nerve. These evaginations, or axillary pouches, are usually outlined by pantopaque during myelography. Pathologic significance is attached to abnormal outlines of these pouches in myelography.

The components of an I/D are: paired cartilaginous articular plates, a fibrous ring (annulus fibrosus) and the nucleus pulposus. The cartilage plate does not extend to the peripheral margin of the disc but merges with the fibers of the annulus. The annulus is a homologue of the fibrous capsule of joints in the extremities and it fills the outermost zone of the intervertebral space. Its connective tissue lamellae run from one vertebral surface in a wide curve to the adjecent surface of the next vertebra. Contained centrally in the disc and surrounded by annulus is the incompressible fluid-fibrous mass of the nucleus pulposus.

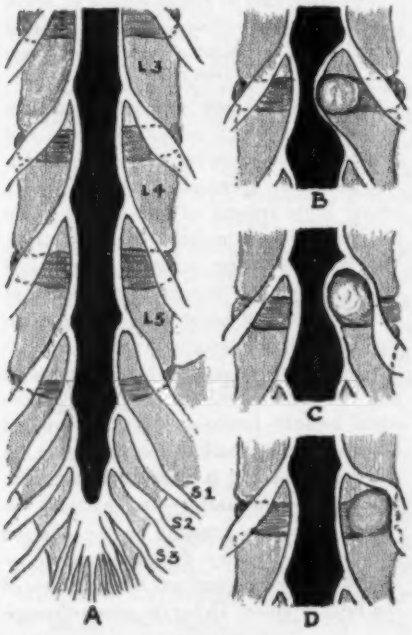
The principal change in the I/D during growth is reduction in fluid content. At birth the nucleus is a mass of mucoid gelatinous fluid in a reticulum of mesenchymal cells. This nucleus expands into the margins of the cartilaginous plates but its fluid content decreases. Calcification of the annulus may occur in children and young adults and is not uncommon in

middle and old age. At times this calcification appears to be physiologic rather than evidence of disease.

The upper and lower surfaces of vertebral bodies are not limited by closing plates of compact bone. Instead the trabeculae of the spongiosa are concentrated transversely into a plate which has innumerable perforations. These perforations permit transfer of fluids from the vertebral body into the disc. In this way the disc is nourished and sometimes infected from the vertebral body.

The intersegmental arteries of the developing spine supply most richly the tissue closest to them and such tissue develops into vertebral bodies. Tissue midway between intersegmental arteries is poorly nourished and becomes intervertebral discs. Nourishment for the discs is derived from the adjacent vertebrae but it becomes progressively poorer after birth. After the age of twenty years, vascular supply to the discs is not demonstrable. The syndrome of I/D is practically unknown before the age of twenty. Thereafter the incidence of disc pathology increases and appears to be related to degenerative changes. Calcification and gas accumulation within a disc are roentgenographic evidences of degeneration which is frequently visible during or after the fourth decade. Gas is derived from the blood stream and it accumulates in space left by disintegration of the nucleus following trauma.[30, 43, 62] One may postulate very poor reparative processes in such an avascular tissue. Hence disintegration rather than repair is likely after trauma.

Fig. 4. Diagrammatic drawings showing shape opaque substance would assume in spinal canal as seen in x-ray. A. Normal. B. Central disc protrusion. C. Lateral disc protrusion with nerve stretching over it. D. Posterolateral disc protrusion presses on nerve but does not change opaque picture.



Disc degeneration may result in narrowing of the disc space even without disc rupture. Decrease of the intervertebral space may permit abnormal sliding or tilting of adjacent vertebrae and thus be productive of symptoms. This may occur at one or numerous intervertebral spaces simultaneously. Pain will persist until hypertrophic bone spurs develop between the affected vertebrae and prevent movement of the affected levels.

Narrowing of the interspaces from disc degeneration may result in such a degree of encroachment upon the intervertebral foramen as to result in pressure on the nerve root without disc protrusion. It is important to realize that not all disc symptoms are produced by disc rupture. When symptoms are due to nerve root impingement secondary to disc degeneration, surgical removal of the disc could exacerbate the difficulty by producing further narrowing of the I/D space.[36]

C. Pathology

1. Age Factors In 500 cases, O'Connel (53) had 330 males and 170 females with age distribution as follows:

11-20	20	4%
21-30	174	34.8%
31-40	190	38.0%
41-50	93	18.6%
51-60	23	4.6%

Every one of us has suffered repeatedly from trauma severe enough to produce I/D rupture, if the reported causes are to be accepted. Anything from a sudden sneeze to swinging a baseball bat or living through an airplane crash has been invoked as being a productive agency. It can accompany fracture of vertebrae. Direct penetrating wounds are responsible. Lumbar puncture is reported as a frequent cause in children. During early life the nuclear material is much more fluid than in adulthood. It is, therefore, possible to aspirate the nucleus pulposus. L B P following spinal tap in a child may mean unintentional disc aspiration. This is an indication for check-up AP and lateral lumbar spine films at intervals until such damage can be ruled out.

Lumbar puncture in childhood is usually done when meningeal infection is suspected. That is just the very worst time to puncture a disc. A smouldering infection of the disc can result from inoculation of the nucleus by organisms from the cerebrospinal fluid.[5, 11]

2. Classification The disc may be congenitally absent, whereupon the adjacent vertebrae are fused into one large unit or block vertebra. Other congenital abnormalities of the discs are associated with hemivertebrae, etc.

Degenerative and traumatic lesions range from unexplained nuclear expansion of adolescence to senile degeneration of discs in senile kyphosis. Herniation of the discs into the vertebral body (Schnorl's node[64]) occurs through a defect in the cartilaginous plate. The defect may be degenerative or developmental in origin. True hypertrophy of discs has been described.[49a] Bradford and Spurling[9a, page 100] give calculations to show how an apparent increase in disc volume may be due actually to a change in shape without volume increase.

Infective diseases of the vertebral bodies ultimately affect the discs. Rheumatic conditions in which cartilage is destroyed produce unilateral or bilateral narrowing of discs spaces. Senile osteoporosis and osteochondritis also affect the discs.

3. Pathologic Physiology Herniation of the nucleus may occur explosively coincident with a sudden rent in the retaining annulus fibrosus. Cramer describes an autopsy after sudden death from a dive into shallow water.[18] The cervical cord was almost severed opposite the C5 disc but there was no fracture or dislocation. Explosive herniation of C5 disc had forcefully compressed the cord. Less dramatic effects in the lumbar spine are produced including complete blockage.[24]

The initial pain of herniation is usually L B P. Nerve endings are present in the annulus and posterior common ligament. Tearing or stretching affects the pain fibers. Sciatic pain arises from compression or stretching of cauda equina or nerve roots. Various authors have illustrated variations in the point at which such pressure may occur.[9a, 46a, 53, etc.]

Secondary to pain production are the clinical signs which permit diagnosis and localization. A physiological chain reaction with complete splinting of the back may follow acute trauma of any sort to spine ligaments, fascia, muscles, bone or discs. The pain-producing stimulus responsible for splinting is intrinsic (pressure of herniated disc on nerve root) and continuous (although intermittent protrusion[5, 16] has been demonstrated). Muscular spasm may produce kyphosis in place of the usual lumbar lordosis. Many have noted flattening or reversal of the lumbar curve and supposed that it was due to a neuromuscular compensatory mechanism designed to reduce pressure on the affected nerve root: Charnley denies this after research on the longitudinal bending axis of the lumbar spine. This axis passes through

the posterior quarter of the vertebral bodies and there is not more than 1 mm. change between flexion and extension at the location of the spinal theca. Charnley[15] believes the protruded disc jams open the interval between the posterior margins of the vertebral bodies and thus produces flattening of the lumbar curve independent of muscle spasm.

Anatomists suggest that flexion of the spine produces backward movement of the nucleus pulposus. Radiographic studies by Begg and Falconer[8] showed that a posterior nuclear protrusion was more prominent, not during flexion, but during lumbar extension. As a whole, experience reveals that movement of the protruded material is minimal in response to postural changes. Indeed it is better to realize that the protruded nuclear material is abnormal than to imagine it as the semi-liquid substance of an uninjured disc. Protruded nuclear material is likely to be tough and resistant to change of shape. Between the vertebral bodies, the space from which the nuclear material protruded is quickly obliterated. Return of the nucleus to its normal position[21] within the annulus fibrosus is usually, therefore, physically impossible. The finding of Begg and Falconer, that the protrusion was more prominent during lumbar extension, is easily explained. With extension, the abnormal, rubbery, nuclear material is squeezed between the more closely opposed posterior corners of the adjacent vertebral bodies. Simultaneously the annulus fibrosus is relaxed posteriorly, permitting the compressed, abnormally situated, protruded, nuclear material to bulge out posteriorly.

D. Diagnosis

1. Clinical Signs "No patient suffering with low back pain, with or without sciatic pain, is evaluated completely until the existence of a protruded intervertebral disc in the lumbar region is ruled out diagnostically."[26] The absence of sciatica does not rule out disc pathology but the clinical diagnosis of I/D syndrome, in the absence of laboratory aids, depends upon the demonstration of neurologic changes assumed to be secondary to disc protrusion. Myelography and lumbar puncture are not essential for the diagnosis of ruptured I/D but they must not be omitted if that diagnosis is to be excluded.

Most patients have L B P and leg pain together. About 10% have leg pain only. Some have several attacks of LBP before developing sciatica. Back pain alone from disc protrusion is seldom so severe or frequent as to require operation. Two-thirds of patients have back and leg pain for more than 12 months before surgery is performed.

More than two-thirds of patients have sensory changes: hypesthesia, anesthesia, hypalgesia or hyperesthesia. Motor changes are even more frequent but perhaps less readily realized by patient and examiner. Abnormal reflexes are present more than half of the time. Knee jerk depends on contributions from L2, L3 and L4; ankle jerk, L5, S1 and S2. Absent KJ is present in L2 and L3 protrusions 50% of cases and in L4 and L5 protrusions only 5%. Absent AJ is present in more than half of all protrusions of L2, L3 L4 or L5. An upper disc, of course, may produce pressure on lower roots within the cauda equina.

Extensor weakness of the great toe is a frequent, early and overlooked sign in disc lesions.

The most frequently protruded discs are between L4-L5 and L5-S1. Clinical differentiation is difficult. Paresthesia and other sensory changes may be found for:

L5-S1 (posterolateral calf, lateral foot, fifth toe)

L4-L5 (more anteriorly and on the dorsum of the foot and great toe)

The jugular compression test increases intraspinal pressure by blocking venous

drainage and distending the veins in the epidural space. When manual compression is negative, the Naffziger test is often nevertheless positive. It consists of wrapping a sphygmomanometer cuff around the neck, raising the pressure to 40 mm. Hg. and waiting 90 seconds for the intensification or development of back and sciatic pain or paresthesia.[6, 51a]

2. Straight Leg Raising (S L R) A student in Paris wrote his doctoral thesis on the subject of sciatica in 1881. He dedicated the writings to his mother and father and to all his friends as well as to his chief, Dr. Lasegue. The particular contribution of this student[72] was his description of the S L R test for sciatic pain. This is sometimes called the Lasegue test.

The patient lies supine. The physician holds the heel with one hand and the knee with the other, keeping the knee extended whilst flexing the thigh. Pain produced in the sciatic notch upon raising the leg constitutes a positive S L R test. This pain may be avoided, in flexing the thigh, if the leg is first flexed at the knee joint.

Variants of the Lasegue S L R test are of interest. One may begin with flexion of the knee joint and after bringing the thigh against the abdomen, attempt extension of the leg on the thigh. In sciatica this will elicit a pain response. Again, the patient may be seated and directed to extend the knee joint. In sciatica, this will produce pain. In any of these variants of S L R, exacerbation of pain is produced if dorsiflexion of the foot is added after initiation of the pain response. Neck flexion also increases the pain.

In many cases the S L R test will be positive in both legs with unilateral involvement (or disc). S L R of the well leg may produce unpleasant sensations in the well leg but more often results in exacerbation of the sciatic pain in the affected limb. This response of the well leg to S L R has particular localizing significance for the surgeon. Woodhall[72] found the well leg test positive in one third of disc

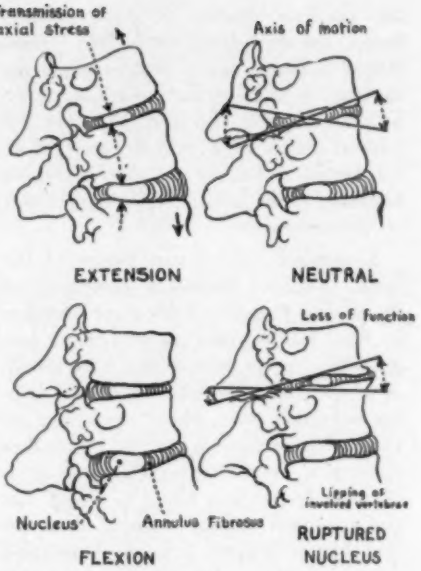


Fig. 5. Diagrammatic drawing illustrating the function of the intervertebral disc (after Albee).

patients and most of these had large protrusions. The localizing significance is that in every case the disc protrusion is on the medial aspect of the affected nerve root when the well leg test is positive.

Numerous observers have noted in the morgue and in the operating room that flexion of the thigh, with the leg extended, causes typical movement of the extradural nerve roots. The roots at L4, L5 and S, move caudally and anteriorly. Falconer[25] exposed a disc lesion with the patient lying on his side and then observed changes produced by S L R. The affected nerve root tightened over the summit of the protruded disc. The degree of limitation of S L R preoperatively had been recorded. It was seen at surgery that this degree corresponded to the stage at which considerable tension developed between the nerve root and the bulge of protruded material. Infiltration of the affected nerve root by local anesthetic, at the point where

it crossed the bulge of the protruded disc, abolished the pain on S L R. Therefore Falconer concluded that the pain in S L R is due, not to muscle spasm, but compression and stretch of extradural nerve roots.

Charnley[18] reports, from observations on cadavers, no movement of the nerve roots during S L R until an angle of 30° to 40° is reached. Thereafter movement is continuous up to 70° or 90°. Clinical studies led Charnley to conclude that S L R is of greater value as a test than *all other clinical and radiological signs of disc.* Limitation of S L R has two different mechanisms: (a) severe limitation to less than 40° is produced by mechanical, extrinsic pressure on the root (b) slight limitation permitting S L R to at least 70° is evoked by tension and the cause of trouble will not necessarily be removed by disc surgery. When S L R is limited to a maximum of 40°, the chances of finding no disc at operation are only one in ten. When S L R is possible to 70° or more, facetectomy, spinal fusion or some other procedure may be found necessary upon exploration.

3. X-ray Films of the Spine Critics of myelography claim that the diagnosis of ruptured I/D can be made without the procedure. They do not gainsay the value of plain films of the spine. Expert interpretation of *good* films should always precede myelography or laminectomy. This interpretation will be made after a study of: (1) alignment of the vertebrae

(2) structure of the
   a) transverse processes
   b) vertebral ends of the ribs
   c) vertebral bodies
   d) spinous processes
   e) pedicles
   f) apophyseal joints
   g) intervertebral joints and discs

(3) changes in the ligaments and soft tissue structures

Such detailed study of plain films may result in the discovery of a minute area of decalcification. This may be present even with no alteration in outline of the affected bone and still constitute a clue to unsuspected malignancy or other disease, capable of producing symptoms simulating I/D syndrome.

In every case it is well to know the condition of the lumbosacral spine:

(1) developmental abnormalities
(2) arthritic changes
(3) traumatic changes
(4) signs of infectious disease
(5) signs of primary or secondary neoplasm
(6) signs of systemic diseases

Recognition of such changes may be a guide to the surgical or other procedure contemplated or may suggest abandonment of the plan as an unnecessary or useless procedure.

Some feel that plain films give as much information as myelography and use the following criteria:[8, 17a, 29, 31, 32]

(1) narrowing of the interspace
(2) asymmetry of the interspace
(3) sclerosis of the vertebral borders of the affected disc space
(4) osteophyte formation, especially of the posterior borders
(5) localized scoliosis
(6) relative displacement of the vertebral body (Knutsson's sign)
(7) loss of lumbar lordosis

Narrowing of the interspace is seen as early as 1-5 months following the injury believed to have initiated the prolapse.

Narrowing of the interspace results in an altered relation of the apophyseal articular surfaces which is usually accompanied by arthritic pains.

Knutsson's sign of disc degeneration is a demonstration of instability of the relationship betwen adjacent discs. Lateral films are taken in flexion and extension. When forward bending produces anteposition of the cranial on the caudal body and backward bending produces retroposi-

tion, the sign is positive. By correlation[23] of roentgen and autopsy findings in 100 cases, Knutsson's sign was recognized to be indicative, not of early change, but of advanced structural change.

4. Myelography "Those who do disc surgery without myelography must accept a small but definite risk of missing a tumor."[76] Some cauda equina tumors are indistinguishable from disc lesions except on myelography.[69]

Wilson[71a] reviews 100 compensation cases of I/D and considers the results of surgery unsatisfactory on a cost basis for the results obtained. He concludes that better evidence than symptoms and physical findings is necessary. A disc should be demonstrable by myelography before surgery is recommended. Many industrial physicians agree. In some states myelography is required prior to surgery in compensation cases.

Multiple lesions[57] can be detected prior to surgery and precise localization of the lesion or lesions is possible preoperatively. Comparison (1949) by Marble and Bishop[48] of correlation of myelographic and surgical findings in old and recent disc series reveal that doctors are now more skilled in technics and interpretation of myelograms. Nevertheless there will be negative myelograms in the face of good clinical evidence of disc. It is well not to ignore such negative evidence because even when the surgeon then reports finding of disc rupture, patients fail to recover and the surgeon's ability to distinguish normal and abnormal discs must be examined. It is well also to realize that other conditions will produce the I/D syndrome.

When the myelogram is negative, roentgen study of intervertebral foramina is indicated. Oblique films will show all but the L5 foramen, for which special positioning is required.[45] Pathologic changes in structures bounding the foramina[35, 36] may reduce their diameter and cause nerve root pressure: (1) osteoarthritis with collapse of discs into the vertebral bodies or thinning of the discs may result in approximation of the pedicles and decrease in the cephalocaudad diameter of the foramen. Hypertrophic spurs may project into the foramen.

(2) reverse spondylolisthesis decreases the A P diameter of a foramen.

(3) hypertrophy of the ligamentum flavum (which is also present, at times, when a "chronic disc" is found).[19]

A detailed description of myelographic technic can be found elsewhere[40, 65, 71 etc.] as well as a detailed review of its development.[14]

5. Disc Puncture Criticism of myelography has led to the search for additional, objective, diagnostic criteria. Disc protrusions produce indentations of the column of radiopaque material—a negative or indirect evidence of the abnormal location of the disc. It is well to realize that not all symptom-eliciting protrusions occur in a location which permits them to indent the dural sac. If changes in the nerve root sheath are not seen, such discs are unrecognizable by myelography.

Lindbloom[46a] believes there are small disc protrusions directly into the intervertebral foramina. They compress the nerve roots and do not indent the dural sac. They can be demonstrated. To demonstrate them, direct disc puncture is utilized. Radiopaque medium is injected into the nucleus pulposus and it spreads out, opacifying nuclear material wherever it may be. The normal disc accepts not more than about 1 cc. but ruptured or degenerated discs may take as much as 3 cc. or more. The injection sometimes elicits exact reproduction of the nerve root pain from which the patient suffers. The contrast material utilized for disc puncture is usually skiodan.

Lindbloom has done a lot of basic anatomicopathological study as background for his recommendations. There is no evidence against the adoption of his method. Hoen *et al.*[38a] do not use radiopaque ma-

terial but rely for differentation of normal and diseased discs, on the:

(1) reproduction of L B P by injection of the diseased disc
(2) Acceptance of less than 3 cc. of saline by normal and 3-10 cc. of saline by abnormal discs.

E. Differential Diagnosis

This discussion of I/D syndrome is but a part of a review of all causes of L B P. The differential diagnosis is covered in the larger discussion.

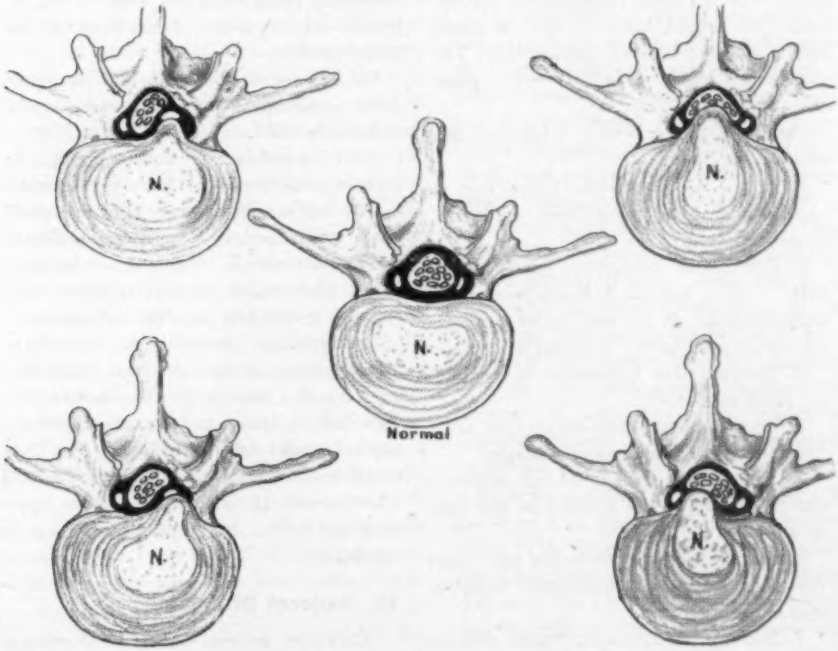
Besides L B P, however, all other causes of sciatica need consideration. Infective bone processes, bone tumors and intraspinal neoplasms are important. Plain films of the spine are helpful. Brocher[10] describes 7 cases of tuberculous spondylitis with nerve root compression.

F. Treatment

Most disc cases should probably still be given a non-specific label such as lumbago or sciatica. The pressure of lay opinion has forced us to "definitive surgery" very often. The public wants action and quick results. The majority of disc cases recover spontaneously but suffering is reduced by medical management. Surgery should be reserved for cases in which conservative treatment has been prescribed and actually followed, without success. This leaves about 20% who require surgery. Cauda equina involvement is an absolute indication for surgery and is encountered once in fifty cases. When conservative therapy has been adequately followed over a three-month trial period, the need for surgery can be properly evaluated.

Good surgical results cannot be antici-

Fig. 6. Diagrammatic drawings of a vertebra from the lumbar region showing the normal position of the intervertebral disc and various positions of the ruptured disc.



pated where the emotional accompaniment of pain is excessive. Poor results frequently occur when S L R without pain is possible beyond 50°.

Three distinct tasks should be considered by the surgeon during his technical procedure: (1) decompression by removal of herniated nuclear material, (2) relief of tension about the nerve root from adhesions between it and material from the disc, (3) prevention of recurrence of symptoms. Current opinion favors removal of all degenerated tissue, whether displaced or not. Recurrences are sometimes due to prolapse of additional material which could have been removed initially.

Armstrong[3] reports that between 5 and 40% of surgically treated cases are recorded as unsatisfactory results. His analysis of the reasons for failure demands attention. Foremost cause is wrong diagnosis! This should be remembered by all of us and, by more studious attention to history and physical examination, eliminated. This should, however also be noted by the sharp critics of laminectomy. The operation is highly satisfactory when properly indicated.

Causes of failure where indications are adequate include:

1. Failure to locate the lesion due to approach at the wrong level or inadequate exposure.

2. Failure to recognize (and relieve both) double lesions. A lesion may occur simultaneously at L4 and L5 or a single disc space may have a bilateral herniation.

3. Postoperative herniation of remaining nuclear material.

4. Root damage from surgery or from adhesions occurring postoperatively.

5. Subsequent disease at an adjacent disc level which was healthy at the time of surgery.

6. Permanent changes in the nerve root from long-standing, preoperative compression or tension.

7. Damage to articular facets. Decompression of the nerve root in the foramen is a procedure of debatable merit. Some hold that enlargment of the foramen by facetectomy[36] is desirable and often necessary for relief of sciatica. Armstrong "holds the firm opinion that damage to the facets, even on one side, produces an irritable joint which is a source of post-operative symptoms."[3]

8. Arthritis of the intervertebral joint. Removal of the disc inevitably leads to arthritic changes between the vertebral bodies and the posterior articulations as well. Immediate arthrodesis is not, however, indicated as a routine; with suitable postoperative supervision (avoidance of vigorous spinal exercises) the irritable joints become silently ankylosed.

9. Post-operative infection. This may involve the bone and soft tissues, producing widespread adhesions. Symptoms may arise suggestive of the disc syndrome, even in the absence of patent evidence of suppuration. Subsequent trauma to the spine may bring to light a smouldering infection by traumatic breakdown of its encapsulation.

10. Damage to the cauda equina, nerve roots or meninges by faulty retraction or technically difficult exposure.

Each unsatisfactory result should be studied with a view to learning the exact reason for surgical failure. Further treatment, often surgical, will be indicated when the precise cause is understood. Many chronically involved patients may thus be restored to comfort and health.

Postoperative complications are few. Acute spasm occurring about 7-10 days after surgery may be due to osteomyelitis. This may be demonstrable radiographically several weeks later. Antibiotics are indicated but seem usually to be of doubtful effectiveness. A body cast hastens spontaneous fusion. No surgical drainage is employed.

G. General Discussion

Numerous authors have called myelog-

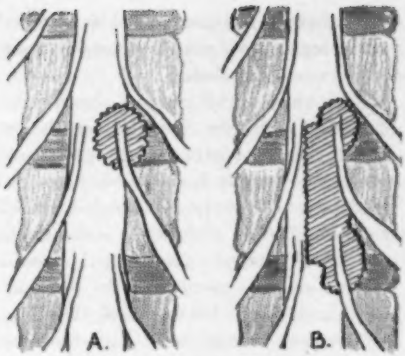


Fig. 7. Diagrammatic drawing showing exposure obtained by interlaminar approach A and by hemilaminectomy approach B in surgery on the intervertebral disc (after Armstrong).

raphy an unreliable diagnostic procedure as shown by surgical findings. Additional criticism has been aimed at the frequency with which disc pathology is diagnosed clinically. Is our index of suspicion now too high?

The report of Aitken and Bradford[1] is cited by Knowles[41a] as proof of the confusion which exists in regard to I/D syndrome. "They studied the files of the Liberty Mutual Insurance Co. from 1940 to 1944 which contained 170 cases of ruptured intervertebral discs. In these 170 cases there was no agreement on what a normal disc looked like. One case was operated on by a neurosurgeon assisted by two orthopedists. Each man forwarded his view of the operative findings. One orthopedist said the findings were normal, while the other stated it was hypertrophic arthritis and the neurosurgeon described the rupture of two discs.

Later in this article, Knowles writes: "These fifty cases were selected because they included all the lost time cases from several hundred back injuries in a plant of over 5000 workers . . .These fifty cases were the most severe allegedly due to injury . . . there were no intervertebral disc cases in this series."

Knowles admirably accomplishes his purpose, which is to urge a reconsideration of the concept of disc pathology. Errors in diagnosis and poor surgical judgment should give way to better study of the patient and conservative therapy.

Nevertheless it is well to look again at the entire subject with a scientific eye. How can we absolutely know whether disc protrusion is present? Pathologists have mistaken disc herniation for chondromas and other benign tumors. This has occurred at autopsy when the spinal canal was laid wide open. How much more difficult it is then, for the surgeon to give an accurate and reliable diagnosis when peering down into the depths of a small wound. His visibility is limited by the intact vertebral structures as well as by seepage of blood. Practical consideration of anesthesia, cosmetic effects and skeletomuscular function limit the surgeon in his explorations. Many and many a time, good surgeons have misjudged the level of their approach and have therefore explored the wrong disc space.

The scientific eye should be turned upon the experience of the surgeon. When has a surgeon sufficient experience to enable him to give a trustworthy opinion regarding disc pathology? To judge by reports in the literature, many surgeons feel entirely competent after a few hundred cases. Discussion of the subject with experienced surgeons leads to a different conclusion. At least one of them has admitted frankly that he would like to retract what he wrote in reporting his experiences with several hundred early cases. His later experiences lead him to believe that he previously missed finding discs because of technical errors, inadequate exploration and inability to recognize pathologic changes.

Experience is an absolute necessity for the man who would do reliable myelography. That man is not always a radiologist. Orthopedists, neurosurgeons and general surgeons who operate for I/D pathology include in their number men who

feel competent to perform myelographic studies for disc pathology. To do reliable myelographic studies these men must be competent fluoroscopists. They should be thoroughly familiar with the limitations and attributes of the x-ray apparatus. They must take sufficient time to make a thorough study in the fluoroscopic room and later, a careful, time-consuming analysis of the spot films. Unless these criteria are fulfilled, the results of myelography cannot be fairly criticized.

Recognizing that many who do myelograms are not full-time radiologists, let us nevertheless refer to them as radiologists. Let us then turn the scientific eye upon the correlation of myelographic and surgical findings in disc cases. Let us suppose we could obtain two men of unquestionable integrity. Each should have had experience in his field with at least 1000 I/D cases, for background. Then let the radiologist proceed with myelograms in all cases where a good indication exists. Give the radiologist full clinical data before fluoroscopy. Give the surgeon full clinical data and the radiologist's report before surgery. Let the radiologist and several competent witnesses be present at the operations. It would be well to demonstrate gross surgical pathology in every case by a photographic record. Examine all specimens microscopically. Extend this procedure for one thousand carefully selected cases.

In all probability this will never be accomplished but until such a scheme is followed, confusion is bound to exist and attempts to correlate myelographic and surgical findings will continue to be meaningless.

Surgeons differ in technical approach and in their opinion of what constitutes a disc. Radiologists differ in their myelographic technic and in their interpretation of radioscopic and radiographic findings. A given surgeon or radiologist will develop different criteria as his experience increases. Therefore, the above scheme insists that correlation be made between the findings of one seasoned surgeon and one seasoned radiologist.

Those who criticize surgical therapy for disc must recognize that the correlation of postoperative results with surgical procedures of various surgeons is probably meaningless. Recently an orthopedist told of two excellent results in individuals with good clinical criteria and myelographic evidence of discs. He operated and found discs. In one case, bleeding was almost uncontrolled. Therefore, he backed out after controlling the bleeding but without daring to remove the protruded nucleus. In the second case an anesthetic complication forced abandonment in the face of a clearly recognizable disc. It is evident that many variations exist.* Consequently a simple cause and effect correlation is scientifically impossible unless an extremely elaborate system of controls be established for a large series. All procedures should be standardized and executed by a thoroughly seasoned operating team with uniform preoperative diagnostic criteria and uniform postoperative care and follow-up studies.

The industrial physician who wishes to differentiate ruptured discs from other forms of L B P should not rely too strongly on statistics. Those who report fifty cases of acute or chronic L B P without a single case of intervertebral disc may be assuming more than they can prove. We know that differentiation of disc cases from other forms of traumatic L B P is difficult even with the aid of all available diagnostic methods. We know that conservative therapy, which is highly effective for myositis or fibrositis or "lumbosacral strain," is often indicated and is sometimes effective for disc syndrome. Are we indeed able to prove that "lum-

*It is conceivable, for example, that even an experienced surgeon, who always operates with patients in the knee-chest position, might fail to recognize a disc when making his approach with the patient in the prone, extended position.

bosacral strain" is not, in reality, another name for a transient manifestation of intervertebral disc pathology?

Confusion does still exist in the important problems of recognition and management of ruptured intervertebral discs. Because men who have devoted great study to the problem are still unable to agree among themselves, it behooves those who have little experience and who do not intend to become experts in this field to seek consultation when confronted with a patient in whom they suspect a ruptured disc. A presumptive diagnosis can be made in clear-cut cases by any alert general practitioner. An incontrovertibly correct diagnosis can be made in atypical cases on clinical grounds alone by no one. The use of all available diagnostic methods including disc puncture is justifiable and advisable prior to surgery when any remaining doubt persists.

Myelography and other specialized diagnostic procedures are worthwhile if done in a studious, unhurried manner by qualified, experienced individuals. Myelography is not worthwhile as a last minute, preoperative study to be sandwiched into a busy operating schedule by the surgeon, who, without time for adequate study of the films, then proceeds with laminectomy.

Neurologists, orthopedists, industrial physicians, general surgeons, neurosurgeons and radiologists are consultants for the general practitioner who prefers cases of L B P and sciatica. There is no generally accepted opinion as to the responsibility or reliability of men from these specialties in recognizing and treating disc problems. An acceptable guide in referral might be as follows:

1. A patient with clear-cut disc syndrome including localizing sciatic radiation could logically be sent to a radiologist who is known to be trained in myelography for lumbar spine films. That procedure could also be requested prior to referral of the case to a surgeon.

2. Whether the surgeon selected is to be a general surgeon, an orthopedist or a neurosurgeon depends upon availability, local reputation and personal knowledge.

3. A patient with a disc syndrome but atypical or obscure neurological signs might properly be referred to a neurologist or neurosurgeon.

4. A patient with L B P not typical of a disc syndrome but with sciatica might well be sent to a neurosurgeon or to an orthopedist if trauma is prominent in the history.

5. The industrial physician serves as consultant principally in cases where compensation is a factor. He is an expert in relating the pathologic findings to occupational factors. His experience and advice often influence the decision of other consultants in regard to specific therapeutic measures. The industrial physician is consulted again, after therapy, in regard to reemployment of the patient. He advises concerning placement in work least likely to produce recurrence or new symptoms as a result of surgically-produced alterations in body structure and function.

(Part II will appear next month.)

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Fertility of Japanese A-Bomb Victims Returns

No prolonged loss of fertility or incidence of abnormal offspring has resulted from atomic bomb attacks on Japan during World War II, according to a report to the Council on National Emergency Medical Service of the American Medical Association.

The results were made known in a joint report by Drs. Charles L. Dunham, Eugene P. Cronkite, George V. LeRoy and Shields Warren. Dr. Cronkite is attached to the U. S. Naval Medical Research Institute, Bethesda, Md.; the others are connected with the U. S. Atomic Energy Commission, Wash., D. C.

"It is too early to write of the eventual outcome of the Japanese who recovered from radiation injury," the report said. "There is enough information available now to warrant the statement that the survivors have regained their fertility and that, among the progeny of the survivors at Hiroshima and Nagasaki, no unusual incidence of abnormal offspring has occurred."

However, the report disclosed that radiation cataracts of varying severity have occurred in an appreciable number of those close enough to receive significant amounts of radiation, and that the incidence of leukemia will be higher among the survivors than in the Japanese population as a whole.

"Treatment [of radiation injuries] from the very beginning should be directed at minimizing the effects of the tendency to hemorrhage and inability to combat infection," the report stated. "The value of antibiotics has been substantiated by a number of experimenters."

According to the report, approximately one-half of the initial nuclear radiation is delivered in the first second after an atomic explosion, and 98 per cent by the end of one minute. Those unshielded by buildings or natural objects will constitute the most exposed groups, those shielded by brick, concrete or metal buildings will be less exposed, and those in tunnels, caves or air raid shelters will be the least exposed. The shielding of some portion of the body such as the head or abdomen may reduce the mortality.

The data of the Japanese casualties have shown that in cases with very severe untreated radiation injuries, death is invariable and may occur from a few hours up to 14 days after exposure, the report declared.

Trigger Point Syndrome

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In the past few years a number of patients have presented as their chief complaint pain which simulated many of the known painful syndromes involving various structures of the nervous, vascular, skeletal and muscular systems of the body. However, careful study of the patients did not reveal the presence of any of these known syndromes and therefore other etiologies were sought and possibly a common denominator for this particular group of complaints.

The presence in various structures of specific nerve organs for the mediation of various impulses and reflexes is well known. In the skin specific areas or spots exist which on stimulation arouse sensations of heat, cold, touch and pain. "These areas are specific for one or another sensation, and are mediated by receptor or sense organs possessing distinctive structural features. This is true of all but pain sensation. For the pain sensation there is no organized end organ, simply naked nerve endings. The pain endings respond to any type of stimulus provided it is sufficiently intense."[12]

Of particular interest to the present problem is the presence of the glomus body (Fig. 1) in the skin which under sympathetic control acts as an arteriovenous capillary shunt for the purpose of maintaining certain circulatory states to the digits, general blood pressure, and local and general body temperature.[7] This structure may undergo benign tumefaction and cause a definitely recognizable painful condition for which surgery is a successful cure,[2, 6] It is not generally recognized that these painful areas may be the source of or even the result of profound changes in the vascular, neural and muscular systems.

For the want of a better term and for the lack of more specific knowledge the descriptive title of the "trigger point syndrome" has been resorted to, in order to describe a series of symptom complexes. These can be quite disabling as will be shown by several case reports.

There is nothing new in the thought that these trigger point areas exist and that relief can be afforded by local anesthesia of these areas. What appears to be unique is that these areas are often intracutaneous and the realization that a very painful disability can occur which may be confused with other syndromes for which unnecessary and unavailing surgery and medical therapy may be resorted to. In this series they have simulated and been confused with migraine, Horton's cephalalgia, hypertensive en-

From the Arthritis sections, Departments of Medicine, Woman's Medical College (Clinical Instructor in Medicine) and Mount Sinai Hospital (Medical Service #2)

cephalopathy, rupture of the nucleus pulposus—the disc syndrome, peripheral occlusive vascular disease, sciatica, joint disease, herniation of the sub-fascial fat, lumbosacral or sacro-iliac disease, neuritis, gout and causalgia.

Technique The technique for eliciting the "trigger point(s)" is to needle lightly (pin prick) the suspected spots in the skin using a twenty-five gauge needle attached to a syringe containing one or two per cent procaine solution. This acts as the firing mechanism. A positive reaction occurs when the painful symptom complex is either reproduced or aggravated. These areas are then marked off by a ball-point pen and other areas, especially the "mother" area, is sought. Initially procaine sensitivity is tested for in the usual manner. These areas are then infiltrated intracutaneously, making a 1cm. wheal. This results in the reproduction and aggravation of the symptoms and after a few minutes in diminution and relief of pain. The number of areas infiltrated and the amount of drug used depend upon the reaction of the patient and his tolerance to procaine. If necessary the procedure is repeated.

No attempt was made to block these areas with ethyl chloride as advocated by Janet Travell.[10]

ILLUSTRATIVE CASE REPORTS

Case 1. An example of similarity to a ruptured disc syndrome, sacro-iliac subluxation and herniation of the sub-fascial fat is illustrated in this case.

Mrs. M. M., age 34, was first seen in December, 1945 complaining of obesity and pain referable to the lower back and right sacro-iliac joint. Elevation of the right heel resulted in relief of symptoms. A year later she complained of pain in the right supraclavicular area which was relieved by procaine infiltration of the subcutaneous tender spots. Four months later in May, 1947 there was a recurrence of the low back pain. At this time the pain was associated with a crampy sensation in the toes of the right foot and numbness extending upwards to the hip. She had experienced low back pain during the year but this was the first time she had any symptoms in the lower extremity.

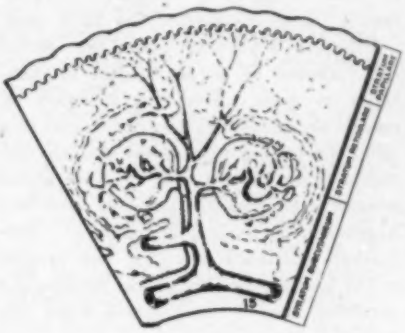

Fig. 1.* Diagrammatic presentation of vascular arrangement and the glomus, as found in the ventral surface of the digit. It shows: (1) all the zones of the skin, including that occupied by the glomic apparatus; (2) the afferent artery of the glomus; (3) the coiled type of Sucquet-Hoyer canal, characterized by a thick wall; (4) the efferent part of the Sucquet-Hoyer canal entering the primary collecting vein, with the latter appearing as a long, wide ruffle encircling the glomus; (5) the relation of the primary collecting vein to other veins; (6) the system of pre-glomic arterioles supplying all the constituents of the glomus and emptying into the primary collecting vein, and (7) division of the periarterial nerve trunks, with branches going to the glomus. This diagram serves to explain arteriovenous and trophic disturbances caused by functional disability and organic destruction of either the entire glomus or one of its constituents.

The latter was described by her as a "wooden leg." A rupture of the nucleus pulposus appeared to be a diagnostic possibility. However, x-ray studies, neurologic and orthopedic consultations were within normal limits. The latter suggested that the condition was "largely due to relaxation with overweight and a short

*Diagrammatic representation of the glomus body as described by Nicholas W. Popoff (**Archives of Pathology**, Sept. 1934). Reprinted by permission of the publisher, the American Medical Association.

leg affair." In a re-examination in August, 1947, he concluded that the problem was neither a bone nor joint lesion since the condition had failed to respond to the usual orthopedic measures.

At this time my attention was called to work of Herz[4] on herniation of subfascial fat as a cause of low back pain.

Procaine infiltration into the sacral subcutaneous fat areas resulted in some relief of pain. This was repeated on several occasions with fair results. At this point the patient volunteered the information that she did not wear the back corset because every time she put it on there was aggravation of pain and numbness. This further convinced me that the trouble might possibly be in the skin because the condition also became worse when she leaned against a chair.

Localization of several trigger points in the low back area by the needling technique reproduced the symptoms. Procaine infiltration relieved the pain and the strange "wooden leg" effect, but caused numbness in the whole lower limb. Subsequent treatments to the same and other areas resulted in complete relief.

The same syndrome recurred in the summer of 1948 and a single block of three such trigger point areas resulted in the relief of symptoms. This relief has persisted up to the writing of this paper.

Case 2. An instance where this syndrome aggravated a peripheral arteriosclerotic vascular occlusive syndrome is illustrated by J. D., age 52, who was seen on June 30th, 1947. He had been treated for the aforementioned syndrome by abstinence from smoking, the suction and pressure boot, rest, alcohol and mecholyl hydrobromide orally. Considering his original condition he had made a good response. Despite this, intermittent claudication occurred after fifty yards. The main complaint on examination was pain in the right calf muscle group with definite diminution in skin temperature. Three trigger point areas were located in the skin overlying the belly of the right calf muscle. One point in particular was quite tender. When this was infiltrated intracutaneously the pain was most excruciating and referred down to the outer malleolus. The other two areas were also infiltrated with a similar reaction. However, after fifteen minutes the patient was able to walk a distance comparable to four-hundred yards before intermittent claudication occurred. On two subsequent visits other areas were likewise treated. The originally infiltrated areas remained norm-esthestic. He is now able to play golf and recently went to Florida where he played eighteen holes on several occasions without any trouble.

Comment An arteriosclerotic occlusive vascular patient had his intermittent claudication distance lengthened by the intracutaneous infiltration of procaine into several trigger point areas on the affected limb. The pathogenic mechanism evidently had been a reflex one, causing spasm of the arteries of the leg in addition to the organic occlusive problem. The cause of the hyperesthesia was unknown, but the primary condition was evidently aggravated by this mechanism.

Case 3. A case simulating acute sciatica is illustrated by E. M., age 70, who for years had severe seasonal bronchial asthma. On June 29th, 1947 pain referable to the left kidney area with left-sided sciatic radiation occurred. Deep thumb pressure over the crest of the left sacrum just lateral to the vertebral column aggravated the pain. Procaine infiltration deep into the muscle resulted in a slight diminution of the pain. On the subsequent visit it was noticed that as the needle penetrated the subcutaneous tissue the pain was aggravated. Infiltration resulted in complete relief of symptoms. In this case the trigger point was subcutaneous. Weekly infiltration of the area on three other occasions resulted in a subsidence of the symptoms with complete subsequent disappearance of the

pain. In this case in order to reach the "trigger point" horizontal injection instead of vertical was resorted to.

Comment A 70-year-old female with "sciatica" and "kidney pain" was relieved by local anesthetisation with procaine of a subcutaneous trigger point.

Case 4. A case simulating intrinsic joint disease is illustrated by G. B. G., male, age 35, an executive by occupation. His trouble began in 1942 when after bending down, he attempted to straighten up only to find that he had severe pain in his right knee. This condition lasted for two months and was treated by diathermy. In 1945 the pain returned in a worse manner and an exploratory operation was suggested. Since then the pain has been fairly continuous, but varying in intensity. In 1948, three months prior to the present examination, pain also occurred in the left knee. At that time the blood uric acid on two occasions was 5.5mg. and 4.4mg.%. Gout was suggested as a diagnosis. Steel foot plates were prescribed without any relief. At the time of the present examination the x-ray revealed normal joints. Specifically the pain was referred to the popliteal space bilaterally at the tendinosus insertions below the knee joint. The pain was aggravated by flexion of the knee with approximation of the skin areas. Trigger points were found above and below the popliteal space. Infiltration with procaine into these areas relieved the symptoms so that on knee flexion no pain occurred. Three treatments of other involved areas resulted in further diminution of pain.

Case 5. F. G. J., age 30, a world war veteran, complained of pain in his left ankle which had been fractured in 1930. X-ray revealed "an old fracture of the lower portions of the left tibia and fibula with arthritic changes evidenced by the thickening and sclerosis of the articulating margins with spur formation. The joint space was normal in size." There had been intermittent recurrences of pain and spontaneous improvement in the pain. As a result of the fracture there was a 1¼ inch shortening of the limb with evident spasm of the iliotibial band, atrophy of the muscles of the left thigh and a painful sacro-iliac joint. A trigger point was located one-quarter of an inch above the ankle posteriorly. Infiltration of this area resulted in relief of the ankle and sacro-iliac joint pain.

On another occasion pain was most acute in the sacral area. This also responded to block of the trigger areas in the skin overlying the sacrum.

Comment Despite the evident deformity—shortening of the limb due to an old fracture of the ankle, symptomatic relief was afforded this patient by picking out and blocking trigger points in distant areas.

Case 6. Mrs. F. M. C., age 60, was first seen on February 26th, 1947. Her chief complaint was pain in the neck, head and arm on the right side. The blood pressure was 240/120, with enlargement of the left ventricle of the heart and an electrocardiographic pattern of left ventricular strain. She had suffered a stroke two years previously. The laboratory studies were essentially negative except for an erythrocytic sedimentation rate of 14mm/60minutes.

The headaches were suggestive of migraine, but later observation during an attack revealed them to be compatible with Horton's syndrome with unilateral headache, eye tearing and rhinorrhea. On previous occasions when she had these headaches it had been the custom of her attending physician to do a venesection. Following this she was usually confined to bed for a week in order to recuperate her strength.

On examination, pressure over the right supraclavicular area reproduced the syndrome and aggravated the pain in the head, neck and arm. Needling above Kuhlenkampff's area[13] caused an intense reaction, making the patient squint and

yell out in pain. Procaine infiltration was immediately followed by complete relief. At first it was necessary to repeat this procedure weekly but later intervals were prolonged to one to two months. At no time was a Horner's syndrome produced. It is also interesting to note that a drop of 20mm. Hg. systolic often occurred with the relief of pain.

X-ray study revealed no evidence of cervical rib, but did show hypertrophic arthritis of the fourth and seventh cervical vertebrae.

Comment Here is an instance of varied and apparently unrelated painful areas with hypertension and Horton's syndrome which responded quite well to a simple procedure; evidently involved was a trigger area located supra-clavicularly in the region of the brachial plexus above Kulenkampff's area.[13]

Discussion In each of these instances the symptoms were reproduced by needling of trigger point areas in the superficial skin and subcutaneous structures unrelated anatomically to the referred areas of symptoms. By speculation these trigger points appear to be hyperesthetic regions existing as painful nerve endings in the skin, the glomus body of the skin, in subcutaneous tissue

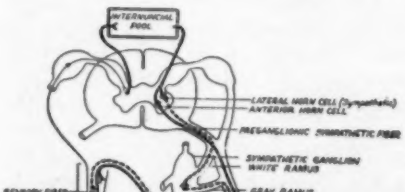

Fig. 2.* Diagram of nervous pathway of reflex sympathetic dystrophy. The afferent pathway is represented on the reader's left, the efferent on the right. Below the anterior horn, the open line represents the sympathetic fibers, the heavy solid line the motor nerves. (from **Surg. Gynec. and Obst.**, Jan., 1946).

areas, fascia, muscle or blood vessel. That they exist in the superficial skin layers is shown by the relief that is often afforded by the simple measure of the intracutaneous procaine block. The structure which may be involved is the

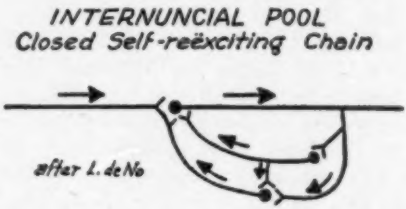

Fig. 3.* Diagram of de No's theory of the internuncial pool. (adapted from **Jr. Neurophysiol.**, 1938, i, 207.)

glomus body of Masson-Popoff. The mechanism of pain and anatomically unrelated neuromuscular-vascular disturbances may be explained on the basis of Evans'[3] (Fig. 2) hypothesis of causalgia which he terms reflex sympathetic dystrophy. The latter may be responsible not only for causalgia, but also for the shoulder-hand syndrome, Sudeck's atrophy (when an artery to the bone is in spasm), Duputryen's Contracture (when the muscle and fascia are spastic) and the peripheral muscular symptoms of poliomyelitis[5,8].

In this manner an ischemic state and a vicious repetitive cycle is reproduced, (Fig. 3). Trigger points per se have been very nicely discussed by Travell[9] as the cause of disability in many conditions resembling and aggravating sacro-iliac disease, the angina pectoris syndrome, and even as a mechanism of the hyperesthesia so commonly seen in hysteria[10]. The reflex arc involving epicritic and proprioceptive pathways to the spinal ganglia and thence to the internuncial cells connect-

*From James A. Evans, **Annals of Internal Medicine**, March, 1947. Reprinted by permission of the editor.

ing to the anterior horn cells (leading to the peripheral muscles) and to the sympathetic cells (leading to the blood vessels) all located in the anterior horn of the spinal cord seems to be the common pathway. Fig. 2. The seemingly unrelated structure and organs are involved by a bombardment of stimuli. Symptoms may persist for a long time even despite the removal of a glomus body tumor.[3]

It seems to me that the most likely explanation of this great variety of clinical observations and results is an involvement of the myelinated and non-myelinated nerve fibers of the glomus body organ.[7] Biopsy evaluation* in a similar case from three involved areas has so far failed to reveal any histological pathology. However, the absence of tumor formation or even of histologic change demonstrable by our present methods of study does not rule out the possibility that this structure may be involved. Perhaps histochemical pathologic studies of a yet unrevealed nature may prove to be more enlightening in the future.

Summary and Conclusions

In this paper a series of cases has been presented whose outstanding symptoms resembled various syndromes of a painful nature simulating intrinsic disease relative to the neuro-muscular-skeletal-vascular system. A total number of twenty-five such cases were seen. Fifteen cases were unassociated with any known etiologic factor, and of the ten associated cases seven were with "subluxation" of the sacro-iliac joint, one with multiple subfascial fat herniations, and two with local trauma.

It is postulated that the mechanism for such a pathophysiologic alteration is involvement of the sympathetic nerve supply innervating the glomus body-organ of Masson, in which case "trigger points" are produced.

Anesthetic block of these areas by procaine hydrochloride was productive of satisfactory relief.

Tumor formation was not grossly detectable in any of the described cases, nor was it histologically demonstrable in an unreported case studied microscopically.

This syndrome may be described clinically as the trigger point syndrome and structurally on a provisional basis as the glomus body-organ syndrome. The possibility that such a condition exists as the cause of pain and pathophysiologic neuro-muscular-skeletal-vascular disturbances should be kept in mind. Its recognition and the relief of the pain and disability afforded the patient will also be a source of great satisfaction to the doctor and obviate unavailing surgical and medical procedures.

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* Performed by Dr. David Meranze, Director of Laboratories, Mount Sinai Hospital, Philadelphia, Pennsylvania.

New Polio Center

The National Foundation for Infantile Paralysis has granted funds to the University of Buffalo's Chronic Disease Research Institute for the establishment of a new center for the clinical study of respiratory and bulbar poliomyelitis.

Refractory Anemia Complicating Systemic Disease

Notes on the Mechanism of Antibiotic-Induced Remission and Cobalt Utilization During an Intestinal Flora Reversion Regimen

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The demonstration that a crude fermentation by-product of streptomycin manufacture, sold as a hog and poultry feed supplement and unsuspectedly containing residual traces of antibiotic, would cause abatement of the usually refractory enemia of acute leukemic subjects[1] came simultaneously with the demonstration that the antibiotic was also the "animal protein factor" of this by-product.[2] This demonstration was followed by that of similar effects for pure, crystalline antibiotics and in rapid succession certain cases of megaloblastic anemia were reported to yield to aureomycin,[3] terramycin[4] and penicillin.[5] The practical aspects of the last demonstrations were perhaps not so important as those subsequently made because megaloblastic anemias are responsive to either folic acid,[6] liver extract[7] or B_{12}[8] but the common occurrence of the last substance with antibiotics in streptomyces fermentation broths has reawakened interest in a pressing medical problem and hope for its ultimate control. For though the megaloblastic anemias are tractable, there are many which remain refractory and agencies to combat erythroblastic arrest ("hemolytic")[9] and myelophthisic anemias may be in the offing. That certain previously hopeless hematologic dyscrasias are evincing a slight vulnerability through proper antibiotic application and that this effect,[10] like that of enhanced animal growth, is contingent on changes in the intestinal flora, seems now indisputable.[11] The last demonstration is under scrutiny by hematologist and animal nutritionist alike. Surgeons are advocating their own approach to the rectification of a situation presumably accomplished by antibiotic ingestion; the elimination of a noxious intestinal flora, or products derived therefrom in the management of refractory anemia.[12]

It is the writer's current practice in the treatment of refractory anemia to maintain complete suppression of proteolytic intestinal organisms (coliforms, *A. aerogenes* and clostridia) throughout the life of the patient.*

*The salubrious effects of this intestinal flora reversion regimen, not only in states characterized by, or manifested with "anemia", but in all of the "atopic", "adaptative", "collagen" or "mesenchymal" diseases as well, lead not only to the assumption that they all have a common etiologic basis, but also to the conclusion that those long-since departed and not well-heralded physicians who kept insisting that acidophilus milk was good for a great many ailments may have been quite right. Current studies confirm the findings of Burrows that the bulgaricus organism would not survive in the adult intestinal tract under the conditions of his studies[13] but they

Now as Fowler has aptly pointed out,[15] "anemia" is not a disease sui generis, but a reflection of some more basic disorder. By the same token, the abatement of the symptom of anemia on any mode of therapy is indicating that the underlying disturbance is being corrected. That the treatment of anemia, per se, is unsatisfactory, is attested by the composition and variety of "hematinics" available to the profession, by the numbers of instances of "anemic" patients ultimately referred to the hematologist (who usually has no more to offer than had the referring physician, if as much), and by the fact that aside from megaloblastic and iron deficiency anemias (where the specific deficiency is easily corrected by constituents in these hematinics) none of the various polytherapeutic preparations for the treatment of anemia evokes much hemopoietic response.

Although anemia may be only a symptom or sign of underlying disease, com pelling reasons may exist in some cases for its direct correction. This situation arises from the fact that compensatory mechanisms to diminished tissue oxygenation may, in themselves, lead to death. Congestive failure is common in many chronically anemic patients whose cardiac output has protractedly been increased to maintain the augmented circulatory rate common in severe anemia. In fact our more recent experience with leukemic patients on sustained antibiotic therapy is indicating that cardiac failure is becoming the chief cause of death in these subjects. This tendency is aggravated by the adrenocorticomimetic effect of antibiotics, wherefore sodium and water retention must be carefully treated; even so it has frequently become irreversible. Anemia, in these instances, constituted a lethal parameter putting a greater burden on the heart than it could withstand; there was little consolation to the patient's family that he had died of heart disease rather than the dreaded leukemia.*

Continuing experience with low dosage streptomyces antibiotic therapy (or rather intestinal flora reversion therapy, for the latter is its essential feature) has indicated that a powerful erythropoietic response may be expected in the hematologic dyscrasias of the young, or in those whose disease is not of long standing. In elderly subjects, or in adults whose marrow reticulum is distorted by the disease process or where there is the advanced yellow metamorphosis of aging, the response to antibiotics is sub-optimal. The red count may stabilize at a level which is lower than the average for the person's age and while this lowered concentration is entirely adequate physiologically, it not infrequently troubles the patient or his attending physician, who likes to see a text-book normal of five million cells per cubic millimeter.

It has been impossible to implement the axiom that "average" and "normal" are not necessarily synonomous. With regard to the serious hematologic dyscrasias, it is nevertheless a fact that many patients will survive in comfort with a blood picture which is frightening. Perhaps too much stress has been placed on blood morphology and too little on blood physiology in this connection. It is becoming increasingly more apparent that

certainly do so, under the conditions of our own studies, when the antagonistic flora is kept under some degree of suppression by one of the coliform inhibitors. It is now apparent that differences among the streptomyces-derived antibiotics, terramycin, aureomycin, chloramphenicol and streptomycin, in their efficacy in this connection, are purely superficial and based rather on differences in solubility and physical characteristics (which in turn govern their persistence in the lumen of the gut) than upon potency in coliform-aerogenes suppression. It may actually turn out, in the long run, that all the antibiotic is practically accomplishing is to idealize conditions for a nutritive regimen enunciated by Metchnikoff.[14]

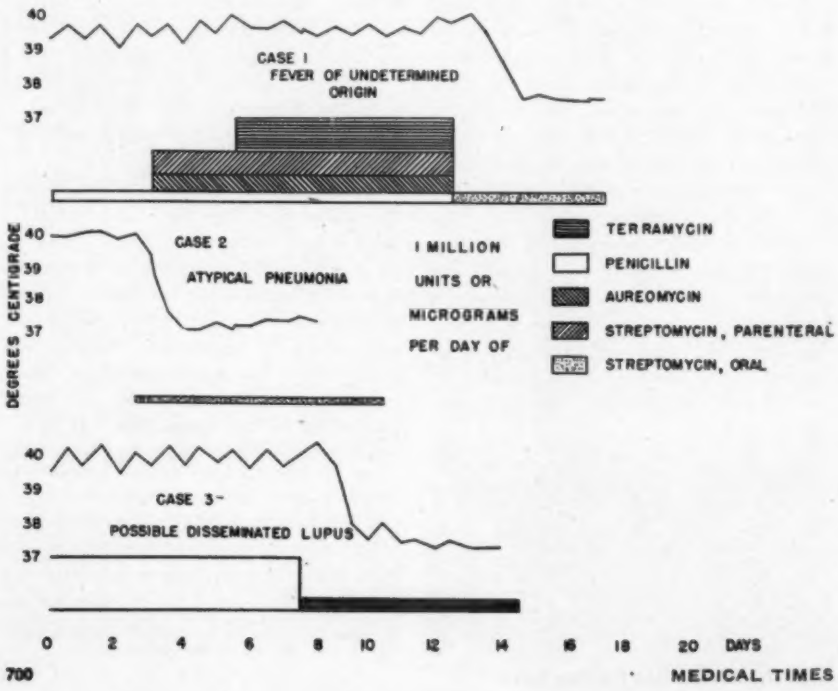
*It may be asked at this point why anemia is not controlled by blood transfusion, to which the answer must be given that in some instances, this is possible, preferably by the administration of packed erythrocytes. In most instances, however, the patient with a severe anemia takes transfusion poorly because of the unsuspected presence of "blocking antibody" and a statistical analysis has shown that death so frequently follows within a few hours of elective transfusion that there is probably a causal relationship[16].

many patients whose blood pictures were a source of alarm but who may still have enjoyed an extended life span, have succumbed to measures instituted to change the blood picture without due appreciation of what was happening to the patient. The folic-acid antagonists[17], indiscriminate elective transfusion[18] and unwarranted splenectomy[19] have now shown themselves to be less than promising in the hemopoietic arrests. That it has taken many years to appreciate their invidiousness should not be surprising; penicillin has been in extended use for almost a decade; that it would cause remission in megaloblastic anemia,[5] and occasionally in acute leukemia),[11] has only been documented within the past few months.

The simultaneous demonstration that antibiotic "animal protein factor" present in *S. griseus* residue would act as a growth promotor in certain vertebrates[20] and induce remission in some patients with serious hematologic dyscrasia[21] may ultimately revolutionize our concepts and treatment of disease affecting the hemopoietic organs. Our present application of this modality to human therapeutics is in its infancy and much remains to be learned. But this learning process can be speeded by a true appreciation of the mechanism of action of "antibiotics" in this connection; actually we are being forced into a position of questioning the classic theories of the entire role of "antibiotics" in the treatment of human disease.

This report will introduce an initial series of cases which seem to indicate the merit of this questioning. The clinical courses of three patients with what any physician would logically regard as "infection" are rendered graphically in Figure I. The rapid defervescence in all,

Fig. 1



when a coliform suppressor antibiotic was introduced into the intestinal tract, is identical to that seen under the same circumstances in Pel-Ebstein Hodgkin's or acute leukemia[11], diseases in which a specific organismal pathogen has never been demonstrated. The cases in Figure I are chosen from among scores that exhibit the same general phenomena, on the basis of specific points to be made. Case 1, on whom a definite diagnosis was never made but whose downhill clinical course, until interrupted by a form of streptomycin base that could never conceivably have left the intestinal tract (this preparation was adsorbed on Permutite Z, an ion exchange resin), received much antibiotic therapy prior to the crisis. We have now presumed on the basis of similar cases that the one under discussion actually represented a febrile reaction to continued antibiotic sensitization (a frequent complication of indiscriminate parenteral antibiotic therapy). But most instructive is the response to *oral* streptomycin after the parenteral form had failed. It is true that in many instances parenterally administered streptomycin will reach the gut, through the biliary channels, in sufficient concentration to inhibit coli-aerogenes organisms, but in many other instances it will not[22]. Another important point to be made, or argument to be answered, pertains to the reason why the terramycin-aueromycin combination given orally did not produce the same effect as oral streptomycin. Part of the answer comes in from the recent work of Kersey who showed that at rather critical B_{12} levels in the culture medium, the streptomyces-derived antibiotics will inhibit lactobacillus growth at a somewhat higher concentration than that required to suppress the coliforms.[23] Since coliform resistance rapidly emerges to any of the streptomyces-derived antibiotics, we are actually depending on lactobacillus persistence to maintain coliform suppression. In Case 1, the stool did not become odorless until a low oral dosage of streptomycin, insufficient to interfere with the implantation of a saccharolytic intestinal flora, was instituted.

Case I has another important connotation. It indicates that too high a dose of coliform suppressor antibiotic will defeat its own purpose, at least in the treatment of atopic disease. The natural tendency on the part of the physician, to keep increasing the administration of antibiotic, when no response is seen within the first 24 hours, is now known to be the reason for some antibiotic failures in the atopic diseases. As a matter of fact, a recently completed statistical study is indicating that the ideal level of administration of antibiotics for "specific" infection may more profitably be one-eighth to one-fourth of the presently administered dose; in the case of the streptomyces-derived antibiotics, terramycin, aureomycin and chloromycetin, from 4 to 8 milligrams per kilogram may be more appropriate than the usual 25 to 50 milligrams per kilogram.*

In case 2, one of "atypical pneumonia", an oral streptomycin preparation known to give a blood concentration of this antibiotic was employed[25]. However, the mechanism of this action still presumably remains that based on the action of the streptomycin remaining within the intestinal tract because a plasma streptomycin level obtained on the day of defervescence showed only 0.8 micrograms of streptomycin per milliliter; less than one-tenth the usual "therapeutic" concentration. The response of "atypical pneumonia" to parenteral streptomycin has been reported[26]. This antibiotic is devoid of in vitro "virocidal" activity and

*Recent data on the growth promoting properties of aureomycin[24] show this same critical feature, in that at too high a level, the response in experimental animals falls off. It is of extreme interest that our empirically determined dosage level in the hematologic dyscrasias should have so closely approximated that which is found to give optimal growth in domesticated animals, since this furnishes an additional argument for a probable common denominator underlying these apparently diverse actions of the streptomyces-derived antibiotics.

here again it must be surmised that the ameliorative effect in this connection is comparable to that produced in atypical pneumonia by cortisone, which is not "virocidal" either.

Case 3 also illustrates the rapid defervescence in a febrile patient, not responsive to large amount of parenteral penicillin, by small doses of terramycin given orally. In this instance the implantation of a lactobacillus flora was insured by co-administration with cultures of the latter organism. Buffy coat examination had shown the presence of an "L-E" cell (we do not regard this finding as diagnostic of any special nosologic entity but rather as a manifestation of sensitization with a granulocytic response) and there was a history of arrested tuberculosis. Here again the dramatic response to what from a systemic standpoint is a negligible amount of antibiotic is reminiscent of the type of response similarly obtained from definitive adrenocorticotherapy in these patients, indicating that the defervescent response to antibiotics may actually have the same basis as that invoked previously to explain changes in the hematologic picture produced by antibiotics.

In order to approach an important generalization about low-level or "nutritional" antibiotic dosage, the theory of its mechanism of action in certain anemic conditions will be re-enunciated, after which attention will be directed to a practical finding that, in some instances at least, this action is potentiated by concurrent cobalt administration.

Mechanism and Extent of the Hemopoietic Response to Orally Administered Antibiotics In face of confirmatory reports of this action[10, 11, 27], an elaboration of our working hypothesis is justified. The hemopoietic marrow is a parenchymatous organ with both a cellular and humoral output*.

On the imposition of a stress situation on the bone marrow (along with the other parenchymatous organs) by systemic disease, the bone marrow reacts as would any other tissue; either it meets the demands made by the stress situation, or suffers injury as a result. These responses are exactly comparable to those of the adrenal cortex to stress imposed by systemic disease and the analogy is strengthened when we consider that, like the adrenal cortex, the bone marrow is a specialized organ for the counteraction of stress; it is the main elaborator of the blood cholinesterase which is operative chiefly in counteracting stress imposed by "atopic" or "allergic" episodes.

Exactly as in the adrenal cortex, if the stress imposed by systemic disease is not met, the bone marrow becomes the "shock organ" and becomes depleted; a failure of function reflected by faulty formed-element production results and this is in turn manifested by erythroblastic arrest, megaloblastic arrest or even leukoblastic arrest (leukemia). If the injury is overwhelming, aplasia with pancytopenia results. There is now considerable evidence for the very old theory that a chief contributor to the stress imposed on the bone marrow consists of bacterial metabolic products arising from the gastrointestinal tract. An older, extended discussion of this *theory* may now profitably be cited,[30] since it is particularly pertinent in light of the *facts* that the advent of present-day antibiotics has permitted practical elimination of certain types of bacteria from this tract and when this is done, bone marrow function invariably improves. We are forced to assume that the elimination has removed an injurious stress from the bone marrow in this instance. But even transcending this im-

*In addition to its evident function of manufacturing erythrocytes, granulocytes and platelets, there is a very important series of other functions of the bone marrow not ordinarily stressed. These are (1) the production of erythrocyte cholinesterase which may participate in the regulation of general cellular permeability[28], (2) the harmonious regulation of the thromboplastin-heparin ratio of the plasma which maintains the eucoagulability state[29] and (3) a possible role in iron, sulfate and polyphenol metabolism.

portant aspect of human disease is the additional fact that a similar elimination of a proteolytic intestinal flora also alters the stress imposed on the skin, where the latter may have been the shock organ because the atopic dermatoses,[31] or scleroderma,[32] may undergo remission under these circumstances; every one of the mesenchymal diseases, the so-called "adaptation" or "stress-decompensatory" tissue changes, has shown some degree of abatement exactly as they do on definitive adrenocorticotherapy[33].

Present studies are indicating the more basic mechanism of the remissions produced in pemphigus, leukemia and Hodgkin's lymphoma by low-level antibiotic dosage where the latter has resulted in an elimination of the proteolytic intestinal flora. These studies have also uncovered a new approach (though hardly a new concept) to the fundamental basis of the "allergic" or "hypersensitivity" state in the human. It is now believed that products arising from an intestinal tract of abnormal permeability may not only depress the bone marrow, directly injure specific shock-organs so that they react by mesenchymal proliferation and interfere with general metabolism, but that they will also block the adrenocorticotropic response which is designed to counteract the stress. Removal of these proteolysis products from the systemic circulation, by removal of their source through appropriate antibiotic ingestion, may not only remove the stress from the shock organ concerned but also remove the block from the adrenocorticotropic mechanism, permitting the latter to function normally, adequately and optimally in response to a stress originating from other than the intestinal tract*.

The adequacy of these theories may require a decade for their complete adjudication. Meantime the practical utility of intestinal flora modification through antibiotic and ancillary therapy has been demonstrated sufficiently to permit the outlining of a regimen to be followed in the treatment of refractory anemia. This regimen consists in certain omissive and commissive measures. The former must be mentioned since their neglect has often resulted in the death of patients with serious hematologic dyscrasia. The purposeful omissions which we now practice are: (1) limitation of blood transfusion, particularly in patients who are likely to have a circulating "blocking antibody," viz., those with congenital and acquired hemolytic anemia, acute leukemia, chronic lymphocytic leukemia and the anemias of chronic glomerulonephritis, therapeutic irradiation and colon malignancy. (2) Splenectomy, which poses a distinct surgical hazard to an already desperately ill patient, who usually reacts poorly to transfusion, has been completely discarded from our armamentarium for the treatment of any hematologic condition, not excluding idiopathic thrombopenic purpura[35], since we get just as good results from low-level antibiotic therapy, as outlined below, in any hematologic dyscrasia which has responded to splenectomy in the past*.

The positive phase of treatment, now having been applied to 200 patients with refractory anemia, including that of leukemia and malignant lymphoma, consists

*This point is made because it is undesirable to incriminate the gastro-intestinal tract in all hypersensitivity states, yet to furnish an explanation of the fact that extrinsic asthmas (where the allergen is respiratory) or a penicillin rash (where the allergen is in a tissue depot) will still yield to oral antibiotic therapy, just as they yield to cortisone or ACTH[34]. The former therapy may be more rational in that the extent of the corticotropic response, once the "block" has been removed, is automatic and adjusted to the requirements of the tissue under stress. Should the stress be removed, the elaboration of adrenocortical hormones automatically stops and this phase of low-level antibiotic therapy, in yielding a regulated, optimal adrenocortical response, may render it decidedly more useful than definitive adrenocorticotherapy whose effects it duplicates in all respects[36].

*It now seems not improbable that the various theories of "hypersplenism" and "splenism" invoked to explain certain pancytopenias and apparently validated by the effect of spleen removal, may undergo modification. Removal of the spleen, by lowering portal venous tension (through removal of the splenic arterio-venous shunt), may merely have modified intestinal tract permeability by limitation of passive portal congestion.

in maintaining a predominantly saccharolytic intestinal flora for an indefinite period. Low-level antibiotic ingestion is only one contributor to this maintenance and each patient requires individual attention and supervision. Our present schedule consists in the daily administration of from 100 to 400 milligrams of terramycin hydrochloride or base daily; divided dosage is used for the first and single daily dosage if the second is employed. Alternately, streptomycin oleate in four, 25 milligram doses, may be given if terramycin gives rise to intractable diarrhea, anal pruritus or abdominal cramps, as it does in about 5-10 per cent of subjects. Each dose of antibiotic is taken with a half glassful of 1. acidophilus (unpasteurized) milk and the total milk intake should be at least 1 quart daily except for patients in whom salt restriction is necessary, when the milk allotment is cut to 1 pint per day along with 80 grams of lactose and a high fat diet.

The patient is told that all bowel movements must be completely odorless; any return of "normal" or unusual odor to the stool must immediately be reported to the physician and the antibiotic dosage modified or a change made to a combination of aureomycin and chloramphenicol or the milk allotment is increased. If an odorless stool still does not result and *persist*, the streptomyces-derived antibiotic is supplemented by the oral administration of K Penicillin G which has been effective in some cases, presumably by the removal of proteolytic clostridia which have antagonized the implantation of a lactobacillus flora.

It is important to emphasize to the patient that the odorless stool is, insofar as he is concerned, the goal of treatment, that its accomplishment and persistence is in his interest and that it may be necessary for him to make his own adjustments in antibiotic intake and diet (a lactobacillus flora is much easier to maintain where a low protein intake is extant). Stool looseness or frank diarrhea, particularly at the outset, should be borne; it seems to be a reaction to the fecal flora reversion rather than to the antibiotic per se. If it does not abate spontaneously on continuation of the regimen, spasmolytics or even opiates should be given a trial since interruption of the regimen is frequently accompanied by explosive relapse. Anal pruritus is more easily controlled by antihistamine ointments or ephedrine-containing suppositories than by any other measure. It also seems to be a reaction to the lactobacillus flora, of which some patients are rather intolerant.

If the antibiotic dosage is proper, moniliasis or other intestinal mycosis should not develop. It is invariably the result of too high an antibiotic dosage; an irresistible impulse on the part of the physician to use the terramycin dose prescribed for "classic" infection. Again it must be emphasized that this is not the reason for antibiotic administration in the hematologic dyscrasias; rather the lowest dose that will maintain the persistence of lactobacilli which themselves are the operative antagonists against the proteolytic bacilli and molds whose catabolic products we are trying to eliminate as the causative agent of the hemopoietic suppression. For this reason as well as for those of economics, the lowest dosage of any streptymyces-derived antibiotic which will maintain a protracted sacchrolytic flora and odorless stool is that employed; some of the writer's patients have been maintained by as little at 10 milligrams of terramycin or 8 milligrams of streptomycin aliphate, daily, for over 6 months.

Finally, for the complete management of the patient on a fecal flora reversion regimen, a careful evaluation of the vascular, respiratory and cardiac statuses is essential because such patients are prone to develop salt and water retention which, if uncontrolled, may lead to cardiac or pulmonary embarrassment. This compli-

cation of sustained antibiotic therapy has been occurring for years but only recently has it emerged as an overt hazard; undoubtedly many children on streptomycin therapy for tuberculosis have succumbed to congestive heart failure while the death was being ascribed to tuberculosis. Sodium and water retention, potassium depletion and hypercholesterolemia are definite adrenocorticomimetic effects of fecal flora reversion therapy; these effects are not inherent in the antibiotic being administered but are rather the natural adrenocorticotropic response to the disease process extant; a response which is freed to execute its natural purpose under the conditions made possible by the regimen. As is to be expected from the mechanism of the adrenocorticomimetic effect of low-level antibiotic therapy, this effect will be minimal in those whose degree of systemic disease is mild while in those with severe mesenchymal disease like advanced lupus erythematosis, polyarteritis nodosa or acute leukemia it may be sufficiently profound as to, in itself, constitute the lethal modality. For this reason, those patients who have serious systemic disease, or in whom the circulatory apparatus is without reserve, are carefully studied for changes in electrolyte balance and liberal diuresis either with mercurials, ammonium and/or potassium chloride or sodium depletion is instituted at the first sign of breakdown in homeostasis. So grave is the danger of congestive failure in acute leukemic patients that all are now routinely given 1 gram of KCl and 6 grams of NH_4Cl daily beginning with the institution of fecal flora reversion.

The Effect of Cobalt Administration During The Fecal Flora Reversion Regimen It has been our previous practice in the management of hematologic dyscrasias to withhold transfusion (except an initial one) because of the experience that the patient became sensitized on successive transfusions and finally died from an indisputable transfusion reaction with a terminal blood count no better than had he been left alone. Withholding of transfusion was validated by the common presence of "blocking antibodies" and "sensitized erythrocytes" in the subject following transfusion, but considerable resistance was naturally met from families of patients and attending physicians because it is heterodoxic to maintain that transfusion is not always the best thing for anemic patients. In practice, however, it not infrequently happens that the patient does better, is more comfortable and lives longer, if the blood count is allowed to come to an equilibrium point by itself; a point incidentally that is not much changed by the most liberal of indiscriminate transfusions.

There is one consideration, however, which invalidates part of the argument that a 30 or 40 per cent hemoglobin level should be left in statu quo. When it became evident that congestive heart failure was a real hazard of low-level antibiotic therapy, through the adrenocorticomimetic effect outlined above, it also became apparent that the augmented circulatory rate and heart output of the anemic patient was inciting the onset of this type of failure. That anoxemia must therefore be combatted in those of low cardiac reserve, by maintaining the hemoglobin at a higher level, was obvious. The consideration was not a new one; Blumgart and his co-workers[36] have repeatedly warned about the congestive failure of chronic anemia, but transfusion still did not give the answer.

It is now evident that earlier successes with acute leukemic patients whose erythrocyte counts continued to climb during the remission period were induced and maintained by a crude *Streptomyces griseus* residue.* They may have been

*BiCon 3, Chas. Pfizer and Company, a product sold as a hog and poultry feed supplement on the basis of "B_{12}" content. The B_{12} was supposed to be an "animal protein factor" until it was demonstrated that the residual antibiotic was just as responsible for the augmented growth in animals (and in chil-

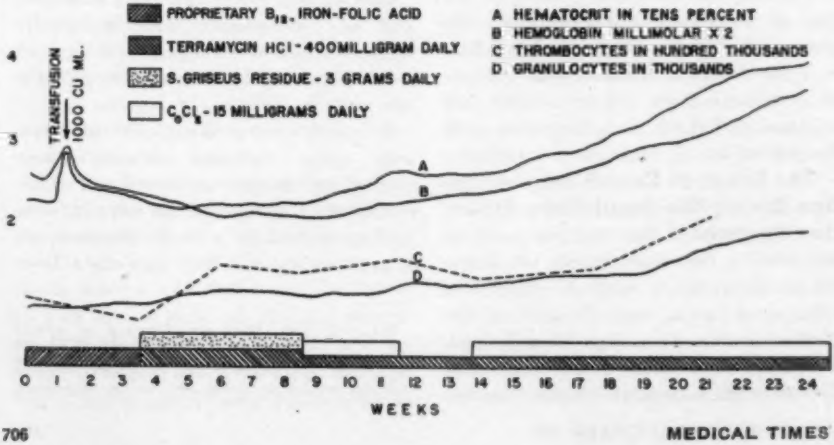
due to the erythropoietic effect of its contained B_{12}. However, the latter effect was not forthcoming when desired. A chance observation led to the re-utilization of cobalt salts for this purpose and, under the conditions of present observation, this appears to be a promising approach.

We had formerly tried and abandoned oral cobalt medication (parenterally administered cobalt is mainly excreted through the intestinal tract) because the dose required to produce any hemopoietic response, from 25 to 100 milligrams as elemental cobalt (60 to 150 milligrams of cobaltous chloride), caused serious gastric disturbances in most patients. Late in 1950, a patient with chronic hemolytic anemia on intestinal flora reversion therapy with terramycin who was in excellent clinical remission, but whose physician was very unhappy because her erythrocyte count would not rise above 2 millions, was given a supplement of 1 milligram of oral B_{12} daily for several weeks without erythropoietic response. To the physician's inquiry about cobalt, I advised against its use since I had found doses above 15 milligrams of the chloride daily to be intolerable. The physician therefore went ahead on his own initiative with this (known to be inadequate) dose, and the red count began to climb during the period of its administration. There were mild digestive disturbances; during its discontinuance the count began to fall toward its previous level. A second period of administration again was accompanied by a steady rise; of course terramycin and milk were constantly being given throughout.

This observation suggested that oral cobalt utilization might be enhanced under certain conditions during which advantage might be taken of an effective lower dosage level. Figure 2 illustrates an additional case, one of stationary Banti's syndrome secondary to periportal cirrhosis, in which successive hematocrit level determinations (more accurately reflecting minor changes in erythropoiesis than red cell counts) show a significant climb during the period when small doses

dren) as was the B_{12}. The original preparation which we used in humans fortuitously contained optimal quantities of both B_{12} and antibiotic for reversion of the fecal flora. Others, sold for the same purpose and devoid of antibiotic, did not produce remission in mesenchymal disease. Current streptomyces-derived animal-feed supplements, by ruling of the Food and Drug Administration, must contain a specified amount of antibiotic but there is a tendency in human therapeutics to utilize pure (crystalline) B_{12} and antibiotic mixtures. It is not certain that this is a good departure; the S. griseus residue may contain other "animal protein factors" applicable to treatment of human disease; the B_{12} in the crude residue seems to be partially dissolved in the lipoid material of the residue and is more absorbable through the intestinal tract than crystalline B_{12} appears to be.

Fig. 2



of cobalt chloride were being given.

More recently, cobalt oleate or the cobalt complex of streptomycin oleate has been used in a series of patients undergoing intensive therapeutic irradiation. The latter material offers some promise inasmuch as it combines the coliform suppressor antibiotic and the metallic element into a single compound. It is already evident that such patients are showing a hemopoietic response which is more favorable than any previously obtained and in sharp contrast to the hematologic course of the usual irradiated patient.

Grateful acknowledgment is made to Dr. Elliott R. Weyer and I. A. Solomons of Chas. Pfizer and Co., Brooklyn, N. Y., for terramycin and cobalt derivatives and to Harold E. Koones of Princeton, N. J., who prepared the streptomycin derivatives utilized in this study, as well as to Dr. Hazel B. Gillespie of Rutgers University whose pioneer investigations in the immunology of fecal flora reversion (see J. Immun., July, 1951) have been a source of encouragement.

Summary

An analysis of the mode of action of orally administered antibiotics in causing remission in certain anemias shows that this action is not unique. Other manifestations of disease, such as fever, also respond to the same change in intestinal flora induced by oral antibiotic administration. It is postulated that limitation of intestinally derived proteolytic products permits the adrenal cortex adaptative mechanism to respond to the stress imposed by systemic disease. This explanation appears more likely since the response is obtained when a saccharolytic fecal flora is substituted for the usual proteolytic one. Any of the coliform suppressor antibiotics which induce and maintain such a change, along with persistence of an odorless stool, is effective in the treatment of refractory anemias. A practical schedule for antibiotic administration control is outlined and certain complications, particularly those of untoward adrenocorticomimetic effects, are discussed.

It appears that there may be enhanced inorganic cobalt utilization for hemopoiesis during fecal flora reversion therapy and the practicality of continued, low-dosage level cobalt administration during oral antibiotic therapy for anemias, refractory to the latter alone, is advanced.

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Intrapleural Rupture of Gastric Ulcer Associated with Diaphragmatic Hernia

Review of Literature and Report of Two Cases

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Intrapleural rupture of a gastric ulcer in an herniated stomach is unusual and catastrophic. Where the existence of an ulcer is known the condition may be suspected, otherwise the diagnosis is well nigh impossible.

No attempt will be made here to discuss the etiology or anatomy of the diaphragmatic hernia[1,2,3] but Miller and Doubs'[5] classification of diaphragmatic hernia is offered as simple and inclusive:

1. Congenital—due to embryonic deficiency—usually without an enclosing sac.
2. Acquired—in most cases as a result of dilatation or relaxation of a hiatus in the diaphragm and when occurring through the esophageal hiatus usually provided with an enclosing sac.
3. Traumatic.

In 1929 Collier et al.[10] in a review of the literature found only three cases of diaphragmatic hernia associated with chronic gastric ulcer.

In 1932 Truesdale[4] reviewed the literature on gastric ulcer associated with diaphragmatic hernia for a period of 95 years—from 1836 to 1931. He reported 17 cases and to these he added a case of his own. In September, 1949 Miller and Doub[5] added four cases,[11,9,12] bringing the total of cases to 22.

Two cases from the literature previously uncollected and two cases up to now unreported are presented.

The symptoms of gastric ulcer in a herniated stomach are varied and more often confused with those of cholecystitis than any other lesion of the upper abdomen.[4] Most often the symptoms are not suggestive of ulcer and the diagnosis is not made clinically.[1,6,7,8,9] Among the symptoms noted were anorexia, weakness, dysphagia and epigastric discomfort. Anemia is most always present. According to Jankelson and Marein[7] anemia is a frequent and important condition associated with diaphragmatic hernia. They state that due to either mechanical injury, localized gastritis and esophagitis or interference with the gastric blood supply, there are mild but frequent hemorrhages or oozing from congestion or erosion of the gastric mucous membrane. Rude[8] found that bleeding can occur without the presence of ulceration. Pressure exerted on the vascular supply by the margins of the hernial opening is a factor in the occurrence of these ulcer erosions. This constricting pressure produces congestion, varicosities and disturbance of the arterial supply followed in some instances by secondary infection and subsequent fibrosis of the surrounding stomach and esophageal wall.

Mild epigastric distress, most noticeable after a heavy meal, and relieved by belching and vomiting, was noted by Rude.[8] As more and more of the stomach becomes incorporated in the hernia the attacks of distress and vomiting become more serious. The pain may be agonizing, due to the diaphragmatic spasm and reflex cardiospasm. The pain may simulate coronary disease.[5, 9] (In Frank's case the presumptive diagnosis was coronary occlusion.[9]

According to Jankelson and Marein,[7] most gastric ulcers are caused by the forceful pressure exerted during attacks of vomiting or by trauma caused by the hernial ring as the stomach is forced in and out through the hiatus. In the nonreducible large herniae constant constriction of a portion of the stomach probably interferes with the blood supply or leads to thrombosis of the blood vessels and this predisposes to an ulcer formation.

They list the pre-operative complications as follows:

1. Anemia
2. Gastric ulcer
3. Gastric hemorrhage
4. Gastric carcinoma
5. Esophageal ulcer
6. Diverticulum of stomach or/and esophagus
7. Dysphagia

and the post-operative complications as:

1. Recurrence of hernia
2. Stricture of esophagus

Truesdale[4] noted that strict ulcer diet did not lessen the severity of the symptoms except for a very short interval. The patient can rarely take food for an hour after a meal for relief of ulcer symptoms because of distress due to the diaphragmatic hernia.

The ulcers found in a herniated stomach vary from a small niche to multiple perforating ulcers.[4, 6] Harrington[15] states that as a rule they are superficial erosions that do not penetrate the stomach wall. For the most part the ulcer is unsuspected and found at autopsy or operation.[5] In a number of cases autopsy revealed an ulcer of considerable size overlooked at operation.[4, 5]

Two previously uncollected cases are reported here, the first from the German and the second from the French literature.

A 29-year-old female complained of dyspnea on climbing stairs, loss of appetite and pallor, vomiting and tarry stools, for which she visited the clinic in April, 1929. X-ray revealed diaphragmatic hernia in post. mediastinum. No evidence of ulcer found. In 1931 a laparotomy was done. The cardiac end of the stomach was adherent to the liver and left diaphragm; there was an ulcer on the lesser curvature. The stomach was resected after adhesions from pericardium and left lower lobe of lung were freed. In October, 1932 she was well, in excellent health and had gained weight.[14]

Desmeules presented a case[13] of a diaphragmatic hernia with gastric ulcer in a patient with pulmonary tuberculosis and syphilis. On operation large multiple stomach ulcers were found and resected. The patient—a 38-year-old person—did not survive the surgery.

Case 1. V. O., a sixty-nine-year-old female nurse, was admitted to the Hospital on 4-30-49. Five years ago she had been operated upon for a diaphragmatic hernia. At 11:30 A.M., 4-30-49, while lifting a patient she had severe pain over entire abdomen and difficulty in breathing. There was no nausea or vomiting. She was seen in shock, her skin was cold and clammy, and she complained of abdominal pain. She was tender over the entire abdomen, more so over the mid-epigastrium and precordial region. At 12:30 a diagnosis of coronary occlusion was made. At 5:00 P.M. that evening the abdomen was soft and the pain localized to the left upper quadrant and chest. Later that evening (9 P.M.) the abdomen

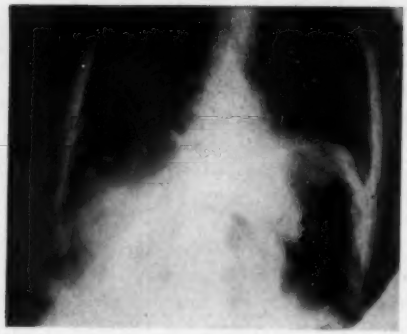

Fig. 1. Case 1.

was moderately rigid and a diagnosis of surgical abdomen was made—generalized peritonitis of unknown etiology. WBC 7500, neutrophiles 83%, Hgb 79; RBC 4,790,000. B.P. 130/70. An EKG was normal. No evidence of recent myocardial infarction. An x-ray of the abdominal area revealed dilated loops of small bowel. There was free air under the diaphragm (see Figs. 1 and 2).

The patient was taken to the operating room at 11:15 that night, twelve hours after the onset of symptoms. Upon opening the abdomen a generalized peritonitis with a large amount of gastric contents and fibrin was noted. A large diaphragmatic hernia was found containing most of the stomach and duodenum with perforation 4 mm. diameter on the posterior surface of the descending portion of the duodenum. 1000 c.c. of blood given. The ulcer was resected, then the diaphragmatic opening was sutured after replacing the stomach and duodenum in the abdominal cavity. Despite supportive measures patient died the next day, thirty-three hours after onset of her illness.

Case 2. R. C., a 33-year-old male was admitted to the Hospital 3rd Sept, 1933 via ambulance following an automobile accident. On admission to the hospital he complained of pain in the abdomen, vomiting of bloody mucus; he was seen in shock. He had compound fractures of left tibia and fibula, a fracture of the pelvis and left pneumothorax. After 24 hours a diagnosis of ruptured bladder was made. The fracture of the tibia and fibula were splinted and patient taken to the operating room where the ruptured bladder was sutured. After a two-month stay in the hospital the fractures of the pelvis and tibia and fibula were healing. The bladder tear had healed and the patient was up in a wheel chair. On November 9, he complained of pain in the right lumbar region radiating to the testicle. Urinalysis revealed many red blood corpuscles, pus cells and clumps. A diagnosis of pyelitis was made and therapy instituted. One week later patient was nauseated and vomited. Again he complained of pain in the right lumbar region. His temperature was 103.8°, pulse 120, respirations 37. There was tenderness and rigidity in the right upper quadrant and over the bladder. The patient became cyanotic, the temperature remained high and the entire abdomen was tender and spastic, especially in the

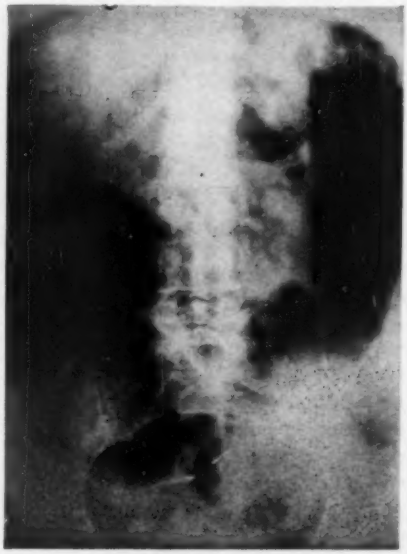

Fig. 2. Case 1.

right quadrants. The WBC 30,600, 90% polymorphonuclears. He died that night.

Post Mortem Examination The right lung was normal, the left lung was collapsed and atelectatic. The lower two-thirds of the left chest cavity was occupied by the stomach. which was greatly dilated, and the terminal portion of the transverse colon and splenic flexure. The left diàphragm was ruptured, the opening being large enough to admit a fist.

The omentum, stomach and transverse colon were held to the diaphragmatic opening by adhesions. A small opening in the stomach was present through which fluid stomach contents could be expressed similar to the large amount of fluid found in the peritoneal cavity. There was much plastic exudate between the liver and diaphragm on the right side which was separated with difficulty.

Discussion The first case presented a diagnostic problem. Here the diagnosis was coronary occlusion until the abdominal rigidity became apparent.

This patient had a history of diaphragmatic hernia and had been operated upon. The lack of adhesions leads one to conclude that the herniation of the stomach was of recent origin. Despite surgery she died.

The second case is that of a traumatic diaphragmatic hernia with herniation of stomach and colon into the left chest cavity. Since there was no previous history of ulcer, it can be assumed that the ulcer developed as described by Rude (8) and Jankelson (7). A diagnosis of ulcer and perforation was not made. The unfortunate occurrence of pyelitis and urinary symptoms masked the diagnosis. The significance of the pneumothorax was not appreciated at the time. The multiplicity of injuries precluded extensive investigation on admission and the apparent recovery, up to the final episode, was assumed to be indicative of correct diagnosis and therapy.

From the Swedish Hospital

Case 1 is from the Surgery Service of Dr. Gerard Kasper.

Case 2 is from the private service of Dr. Kerson Barney and is presented with his permission.

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46 Fourth Avenue.

Cerebral Palsy Meeting

The American Academy for Cerebral Palsy's annual meeting will be held in Boston, Massachusetts, at the Copley Plaza Hotel, on November 16 and 17, 1951. The Friday afternoon scientific session will be an open meeting and physicians interested in the problem of cerebral palsy are invited to attend.

Ganglion

Ganglion is a cystic nodule varying in size from that of a pea to one inch and is composed of a fibrous tissue capsule containing a thick mucinous fluid. It occurs in the proximity of joint capsules and tendon sheaths.

Ganglia occur in females three times as often as in males, and in the majority of cases they appear in the second and third decade of life. They are most common on the dorsal surface of the wrist but they may occur wherever connective tissue sheaths or membranes are, on the palmar surface of the hand, flexor tendon sheaths, distal portions of the finger, etc.

The swelling of the ganglion is either a smooth rounded mass or in case of multilocular ganglion it is a nodular mass. It is usually hard and only occasionally is fluctuant. There might be a variation in its size; it might increase after exercise and decrease after rest. Some ganglia are constantly painful but in others sharp pain can only be elicited by pressure upon the ganglion. (Fig. 1.)

Treatment

A. Rupture The simplest method of treating a ganglion is rupturing the ganglion by striking it with a book and massaging it afterward to disperse the expressed contents. A pressure bandage applied for twenty-four hours over the ruptured ganglion will facilitate the adhesion of the collapsed cyst wall. (Fig. 2.)

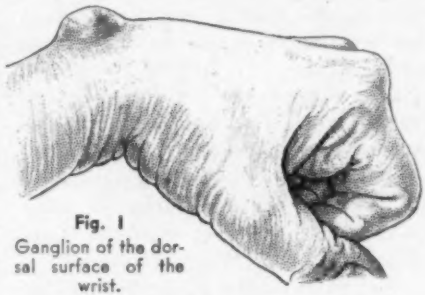
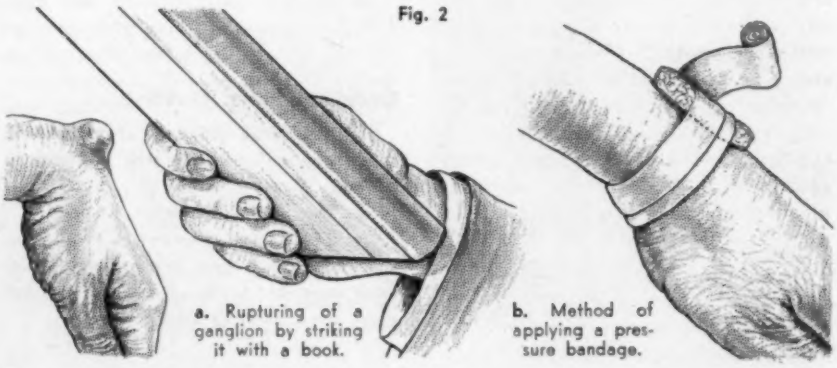


Fig. 1
Ganglion of the dorsal surface of the wrist.

B. Aspiration and Injection of Sclerosing Fluid The ganglion is made prominent by flexing the wrist. The skin is sterilized. A

Fig. 2



a. Rupturing of a ganglion by striking it with a book.

b. Method of applying a pressure bandage.

24 gauge needle and 2 per cent Novocain are used to make a wheal into the skin covering the ganglion. Through this wheal a 14 gauge short needle is thrust into the ganglion and the mucinous fluid is withdrawn with a syringe. After the walls of the ganglion collapse the syringe is removed but the needle is left in place and another syringe containing 5 cc. of a 5 per cent sodium morrhuate solution is attached. This solution is forced into the ganglion until it becomes distended, then the fluid is withdrawn. This injection and aspiration is repeated 3 or 4 times until the cyst walls are thoroughly washed with the sclerosing fluid. If the fluid becomes cloudy the syringe is removed and fresh solution is put into it. After the last aspiration a small amount of sclerosing fluid is left in the ganglion and a pressure bandage is applied, which can be removed the following day. (Fig. 3.)

If no leakage occurs this method is absolutely painless; if some of the sclerosing fluid escapes into the surrounding tissues a rather severe pain will result, which lasts for several hours.

Occasionally two to three injections are necessary to effect a cure.

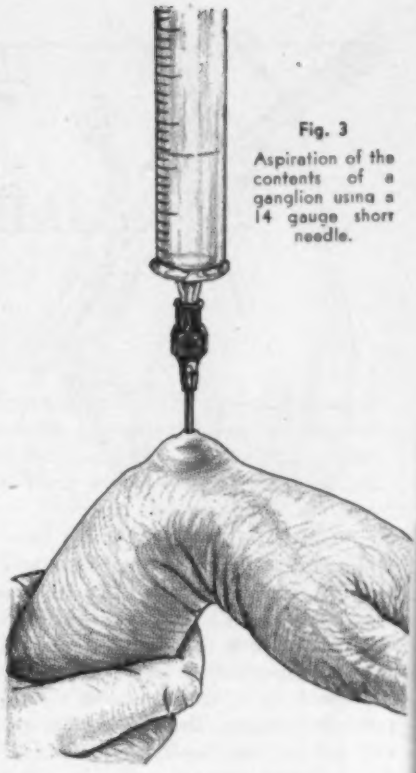


Fig. 3
Aspiration of the contents of a ganglion using a 14 gauge short needle.

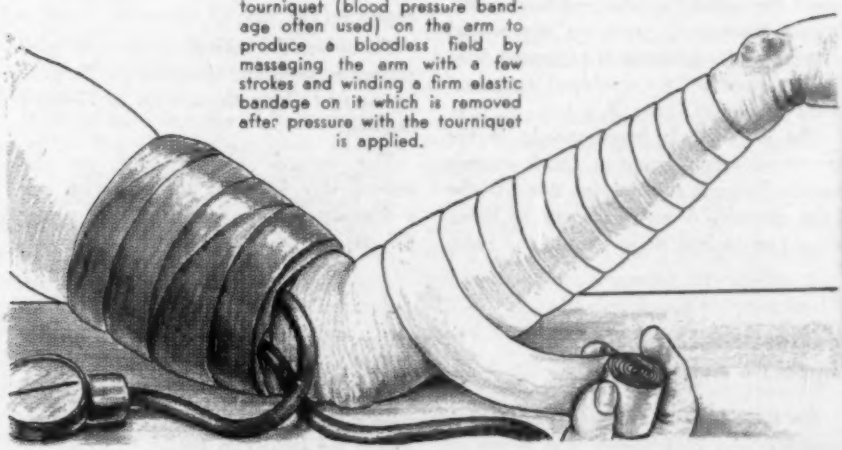


Fig. 4
The method of application of a tourniquet (blood pressure bandage often used) on the arm to produce a bloodless field by massaging the arm with a few strokes and winding a firm elastic bandage on it which is removed after pressure with the tourniquet is applied.

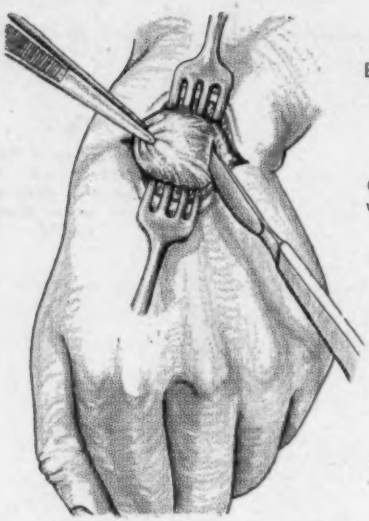


Fig. 5
Excision of ganglion.

Fig. 6
Closure of the wound with mattress sutures.

C. Excision A turniquet is placed above the field of operation to produce a bloodless field. (Fig. 4.) The skin is washed and painted with an antiseptic solution. The strictest asepsis is observed as there is a possibility of opening tendon sheaths and joint capsules. The skin is infiltrated with a 2 per cent Novocain solution. The skin is incised across the wrist in such a manner that the incision follows the normal skin folds. This technique will make the resulting scar not noticeable. Strong traction is made on the wound edges and the ganglion is separated from its surroundings by a combined sharp and blunt dissection. (Fig. 5.)

The ganglion is found mostly in the transverse carpal ligament and it extends usually between the tendons down to the joint capsule. A large amount of tissue should be excised at the base of the ganglion, and if the ganglion is connected with the tendon sheath, part of the tendon sheath should be removed to prevent recurrence.

If during the operation the joint capsule is opened no attempt should be made to close it.

After the ganglion is removed the soft tissues are united to cover the exposed tendons, the skin is closed with mattress sutures, and a compression bandage is applied. (Fig. 6.)

Following the operation there is considerable swelling, therefore a sling is necessary to keep the arm in an elevated position.

The sutures are removed on the seventh day following the operation and a firm dressing is reapplied for another five days.

Kansas Medical School Appoints Acting Dean

Dr. Edward H. Hashinger, professor of medicine and gerontology, was appointed acting dean of the University of Kansas School of Medicine. He succeeds Dr. Franklin D. Murphy, who will become chancellor of the university. Dr. Hashinger joined the faculty in 1921.

EDITORIALS

Announcement

The pediatric editorship has been accepted by Dr. John T. Barrett, of Providence, Rhode Island. He is a diplomate of the American Board of Pediatrics and an associate of Dr. Henry E. Utter, whose *COMMENTS* in the pediatric department of the MEDICAL TIMES over many years have been highly elucidative and constructive. Dr. Barrett will carry on in the Utter tradition.

New Role for the Seminal Cell

If it should transpire that the virility, physique and other biologic characters of men will be greatly impaired, and their ranks decimated, by the atomic wars of the future, it would be well to have in mind and in hand a means whereby the survival of selective human strains might be assured.

What we have in mind is the announcement at the recent Conference of the British Association for the Advancement of Science regarding a new method of freezing spermatozoa, with the capacity to retain vitality and fertility indefinitely preserved.

A. S. Parkes, of the National Institute for Medical Research, has found that the use of quick-freeze mixtures, with temperature reduction to minus 79 degrees C., results in an immobilization of seminal cells in the interstices of crystals which do not "spear" or crush the germ cells. There are no ill effects on the cells and in the thawing process the crystals disappear and the sperm cells emerge into instant life. There might be a few casualties, but these imply a weakness, with selective survival of healthy cells.

The principal point of all this is that through artificial impregnation, employing the semen of biologically and intellectually superior types of men, many generations of children may be engendered long after the death of a donor—which would be in the nature of seminal immortality.

Parkes himself says, "time has lost its significance." He also says that there will be hostile criticism when the meaning of the new method is fully realized. "It is another evidence," he says, "that scientific discoveries can be embarrassing as well as beneficial."

We suspect that the first criticism to be leveled against the method will be that it bludgeons the concept of democracy.

This kind of thing, with its new eugenic slant, makes one think of an H. G. Wells story, or one of the many fantastic yarns now so popular. Assuming its validity, it will not lessen the confusion of many elements in our society, already badly muddled.

How seriously one takes it depends on how deeply one believes in the imminence of an atomic holocaust. It may or may not, in this age of wonders, compel considera-

tion as a possible means of not merely salvaging the race of men but of improving the breed.

A final word—when our jet-propelled rockets reach Mars, we may find this "new" knowledge stale.

Bacteriological Warfare

Morris Greenberg, Director of the Bureau of Preventable Diseases of the New York City Department of Health, reviews the literature of bacteriological warfare in the *Quarterly Bulletin* of the Department. He finds that this literature stresses the unavailability of knowledge of new agents of unusual virulence which can be used in warfare. "Furthermore, the federal investigators consider it impossible for bacteriological warfare to wipe out a community or a large segment of it, or induce an epidemic which will be self-perpetuating. They feel that the dissemination of such ideas is harmful, since they are false, cause hysteria and detract from the consideration of the ways in which bacteriological warfare can be used against crops, animals and human beings.

For a number of stated reasons Greenberg concludes that "it appears doubtful that this method of warfare will find any wider application than chemical warfare has up to the present. Nevertheless it would be foolish to disregard its possibilities and to remain unprepared."

Fast Work, Oscar!

We may expect to see the Congressional stage set next year for Federal Administrator Ewing's plan for hospitalization insurance for the elderly. It will provide for sixty days hospitalization a year for people sixty-five and over.

It is, of course, a back-door approach to socialized medicine.

The aim is to get the thing going by 1953 and to make eligible for emergency care about 7,000,000 people.

The totalitarian slant of this type of socialization is revealed by the eligibility of all in the group concerned regardless of ability to pay. There would be no "means test," both rich and poor being covered.

The Government now has so much money in the till due to full employment and consequent high payments into the Social Security funds that it doesn't know what to do with it.

Oscar Ewing is telling the Government what to do with it.

A.M.A. Public Relations

We understand that the American Medical Association intends to create an advisory board of prominent (non-political) laymen, who will work with the Board of Trustees. These laymen will represent in a public-relations capacity education, law, religion, industry, labor and agriculture.

Amen, say we.

And by the way, why should not the same principle hold good for, and be applied in, many if not all of our county and state medical societies?

Repel Red Boarders!

Now that it has suddenly become obvious to everybody that the great destiny of the profession depends upon the unity that can only be effectuated by total integration of the general practitioner, it is touching to observe the protestations of regard and the tender evidences of consideration from the very quarters that were once so obtuse, indifferent, or even hostile.

This sort of thing is especially manifested in the inaugural addresses of the presidents of leading medical societies. While a source of satisfaction it gives rise to some sardonic reflections in the light of historic perspective.

However, all of us must now close ranks, man the guns, check the jet engines, inspect the bomb bay, unlimber atomic gear, repel Red boarders!

Cardiovascular System A Synopsis

T. M. LARKOWSKI, M.D., F.A.C.S.*
A. R. ROSANOVA, M.D.**
Oak Park, Ill.

Heart Disease Classification

(after American Heart Association)

A. Etiological: arteriosclerosis, syphilis, bacterial infection, rheumatic fever, hypertension, congenital anomalies, etc.

B. Anatomical: valvular and endocardial, myocardial, pericardial, coronary artery.

C. Physiological: auricular fibrillation, paroxysmal tachycardia, premature contractions (extrasystoles), other disturbances in cardiac mechanism; clinical syndromes as congestive heart failure, angina pectoris, Stokes-Adams syndrome.

D. Functional: diagnosis is based on the production of cardiac symptoms by physical exertion.

Class I. Ordinary physical activity causes no discomfort.

Class II. Ordinary physical activity causes discomfort.

Class III. Less than ordinary physical activity causes discomfort.

Class IV. Any physical activity causes discomfort.

Congestive Heart Failure A condition of impaired myocardial efficiency associated with any etiologic type of heart disease. Symptoms depend upon the degree of failure. Clinically there may be dyspnea, passive congestion of the lungs, enlargement of the liver, pitting edema of the extremities and other signs.

Treatment: Active—*General:* Bedrest or restricted activity, salt poor adequate diet, psychotherapy, nursing care, sufficient fluids to satisfy thirst, proper regulation of elimination. *Specific:* Unless previously digitalized, patients *in extremis* should receive intravenous Digoxin 1.0 mg., Cedilanid 1.0 mg., or ouabain 0.4 mg. Patients not seriously ill may be digitalized with 0.1 Gm. (gr. 1½) of the powdered leaf t.i.d. for 2 to 4 days. The maintenance dosage is 0.1 to 0.2 Gm.

Method of recording the venous pulse. The suction cup is applied over the jugular bulb on the right side of the neck.

*Late Professor of Clinical Surgery, Stritch School of Medicine, Loyola University, Chicago, Ill.
**Clinical Instructor, University of Illinois Medical School, Chicago, Ill.

daily. Purified glycosides such as digitoxin are much more potent, 0.1 mg. being equal to 0.1 Gm. of the whole leaf. Symptoms of digitalis toxicity are anorexia, nausea and vomiting, diarrhea, bigeminal pulse, visual disturbances. When diuresis occurs in edematous individuals the sudden release of digitalis to the tissues can result in toxicity. This is known as the water barrage phenomenon.

Symptomatic—*Edema:* Bedrest is essential, mercurial diuretics (Salyrgan-Theophylline, Mercuhydrin, Mercuzanthin), or purine derivatives (Theobromine, Theophylline, Theocalcin) are very useful. *Cyanosis:* Oxygen tent may be necessary. *Dyspnea:* Oxygen, thoracentesis when fluid restricts excursion of the lungs. *Restlessness:* Barbiturates, morphine if necessary.

Chronic Valvular Disease Structural change in one or more valves of the heart resulting in stenosis and/or insufficiency. Rheumatic fever, syphilis, arteriosclerosis, congenital defects and bacterial endocarditis are the most frequent causes. Clinical symptoms vary with the degree of involvement. See preceding section on congestive heart failure.

Treatment: — *Prophylactic:* Prompt and adequate treatment of rheumatic fever, syphilis, respiratory, sinus, tonsillar and focal infections. *Active:* This is primarily symptomatic (see congestive heart failure, bacterial endocarditis, etc.).

Pericarditis An acute or chronic inflammatory disease of the pericardium most frequently associated with rheumatic fever, tuberculosis, virus infections, pneumonia, uremia, coronary thrombosis. Clinically one may find friction rub, effusion, distant heart sounds with a small quiet heart, venous engorgement and sometimes ascites. Pathologic types are acute fibrinous or exudative and chronic adhesive.

Treatment: Treat underlying infection; mercurial diuretics (not in uremia), cardiac regimen, paracentesis if needed. Adhesive types may be treated successfully surgically.

Congenital Heart Disease Anatomic defects of the heart and/or great vessels. Most frequent are septal defects, patent ductus arteriosus (Botalli), coarctation of aorta, tetralogy of Fallot.

Treatment: Cardiac failure is treated in the usual manner. Surgery offers only hope of successful therapy in last three above. Closure of patent ductus; anastomosis in coarctation; Blalock-Tansing or Pott's operation in tetralogy.

Sinus Arrhythmia Heart rate is increased in inspiration and slowed in expiration due to alterations in vagal tone. It is physiologic, there is no treatment.

Extrasystoles Premature contractions of the ventricles followed by a compensatory pause. Caused by alcohol, nervousness, digitalis or toxic substances, they are not indicative of cardiac pathology *per se.*

Treatment: Quinidine sulfate 0.2 Gm. (gr. 3.0) q.i.d. will usually stop them. Procaine Amine may also be used.

Paroxysmal Auricular Tachycardia A series of rapid auricular contractions (180-240/min.) usually lasting several minutes. It occurs in normal individuals but is also caused by toxic states, tea, coffee, tobacco.

Treatment: Vagal stimulation by carotid sinus or ocular pressure, retching. Quinidine sulfate, apomorphine hydrochloride, calcium gluconate are helpful.

Auricular Flutter A regular rapid auricular rate (240-400/min.). Ventricles respond at a lower rate of 2, 3, 4 auricular beats to each venticular systole. Indicates underlying myocardial damage frequently associated with coronary disease, hypertension, mitral stenosis, thyrotoxicosis.

Treatment: Digitalis employed as in congestive failure. If flutter persists quinidine sulfate 0.2 Gm. (grs. 3.0) t. i. d.

frequently corrects rhythm. Procaine Amine is now being used.

Paroxysmal Auricular Fibrillation A total irregularity of rhythm, apical rate above 115 and pulse deficit of at least 10 beats. The signs suggest myocardial damage due to rheumatic, arteriosclerotic, hypertensive or thyroid heart disease.

Treatment: Quinidine sulfate 0.2 Gm. (grs. 3.0) hourly for six doses or less if normal rhythm is established. Not recommended for therapy of fibrillation of long standing (mural thrombi may break off and cause death from emboli). Digitalis is indicated when fibrillation persists.

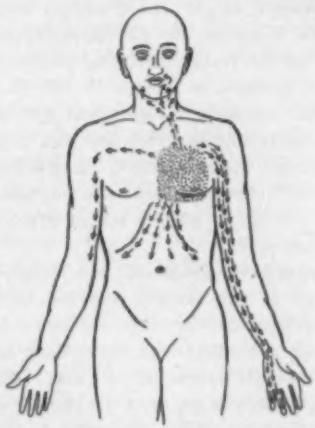
Heart Block Any disturbance of the wave of excitation is called heart block. Etiology is nervous (vagal), toxic (acute infections, drugs), or organic (gumma, fibrosis). Auriculo-ventricular block is most frequent. First degree block is symptomless. Diagnosis is by ECG (P-R interval over 0.20 seconds). Second degree block (partial) exists when the A:V ratio is of small simple integers as 8:7, 5:3, etc. Symptoms if present are those of circulatory inadequacy. Third degree block (complete) exists when A:V ratio is 80:27, 90:34, etc. During the transitory stage when the mechanism shifts to or from complete block, periods of asystole may result in syncope (Stokes-Adams disease).

Treatment: Treat upderlying disease. During periods of shifting cardiac mechanism ephedrine sulfate 30 mg. (gr. ½) or barium chloride 30 mg. (gr.. ½) t. i. d. may be helpful. Cardiac failure is treated in the usual manner.

Rheumatic Heart Disease Acute or chronic involvement of the heart occurring during or subsequent to an attach of acute rheumatic fever. Pancarditis, migratory polyarthritis, fever and malaise are usually noted in this latter condition. Mitral stenosis, auricular fibrillation and congestive failure are the most frequent complications of rheumatic fever.

Treatment: —*Prophylactic:* Adequate therapy of infections to prevent attacks. Sulfonamides or penicillin administered daily during the "cold season" may reduce the incidence of recurrences. *Active:* Pancarditis is treated by bedrest, paracentesis where necessary. Congestive failure, auricular fibrillation are treated by routine means.

Angina Pectoris A syndrome due to coronary insufficiency characterized by sudden attacks of excruciating pain in the precordium radiating to neck, back, left arm. Shock-like symptoms, syncope or death may occur.



Dotted area shows section of the chest where the pain usually originates. Arrows indicate pathways of radiating pain.

Treatment: Immediate cessation of effort stops most attacks. Nitroglycerin gr. 1/100 sublingually or amyl nitrite inhalations relieve. Phenobarbital 15 mg. (gr. ¼), papaverine 30-60 mg. (gr. ½ to 1.0) or aminophylline 0.1 to 0.2 Gm. (gr. 1½-3.0) administered t. i. d. often reduce frequency and severity of attacks. Sympathetic ganglion injection, cervical sympathectomy and newer experimental grafting technics produce variable results.

Acute Coronary Occlusion Obliteration of a coronary artery. Characterized by severe substernal pain (radiation to neck, back, abdomen, arms) lasting several hours, shock, nausea, slight fever, leukocytosis, increased sedimentation rate.

Treatment: Absolute bedrest. Morphine sulfate 15 mg. (gr. ¼), oxygen, papaverine 60 mg. (gr. 1.0) orally q. 3 h., are to be used as need arises. Some men use dicumarol and heparin therapy. Daily prothrombin time must be done with this therapy. Stop if goes below 50% of normal.

Essential Hypertension A disease of unknown origin, either benign or malignant in nature and characterized clinically by headache, dizziness, restlessness and a pressure in excess of 140/90. A diastolic pressure greater than 150 indicates malignant hypertension with a poor prognosis. Pathologically, arteriosclerosis and atherosclerosis are evidenced, especially in the kidney, retina, brain and coronary system.

Treatment: —*Prophylactic:* Weight reduction in the obese; reassurance, rest and relaxation in the nervous, overworked individual. *Active:* Mild sedation, sharply curtailed activity, restrict fluids, rutin (50 mg. q. i. d.), hypotensive drugs such as sodium thiocyanate. This drug is very toxic and the blood level should not exceed 12 mg. per cent. Heart failure is treated as previously described. The surgical treatment of choice is lumbodorsal sympathectomy.

Subacute Bacterial Endocarditis An infectious disease most commonly caused by the Streptococcus viridans. Clinically there is malaise, sweats, low grade fever, petechiae, embolic phenomena, clubbed fingers, leukocytosis and anemia. Pathologically there are verrucous vegetations on the heart valves.

Treatment: -*Prophylactic:* Properly treat all infections in patients known to have heart disease. Pencillin or sulfonamides before and after tooth extraction in such individuals. *Active:* Sulfonamides, penicillin, streptomycin or other antibiotics usually in very large doses as determined by organism sensitivity tests. Heparin and dicumarol in an attempt to minimize thrombotic phenomena.

Syphilitic Heart Disease Several conditions, caused by scarring of the aortic valves, coronary ostia or proximal aorta. Myocarditis and gummata are encountered. Symptoms vary with degree and site of disease.

Treatment: Congestive failure and anginal pain are treated in the usual manner. Therapy of lues is seldom indicated in elderly individuals with quiescent disease or in patients with congestive failure. Others should be treated first with a course of iodides and bismuth or mercury. Arsenic or penicillin should be used with caution to guard against Herxheimer's reaction.

Acute Myocarditis An acute inflammation usually due to acute infectious disease such as influenza, scarlet fever, diphtheria, rheumatic fever, etc., characterized clinically by circulatory disturbances.

Treatment: Treat the underlying disease. Rest is most important for treating the heart. Digitalis or cardiac stimulants should be given with caution, as they may overstimulate the heart.

Essential Hypotension A condition of unknown etiology often associated with wasting disease as cancer, chronic infections, Addison's disease. Clinically there may be neurasthenia, bradycardia, syncope, a systolic pressure below 90 mm. Hg. Some individuals suffer a marked drop in blood pressure in the erect position (orthostatic type).

Treatment: Ephedrine sulfate, Amphetamine Sulfate, Paredrine, digitalis and desoxycortate acetate have been used with some success.

From Larkowski and Rosanova's "Hospital Staff and Office Manual."

UROLOGY

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Essex, Conn.

Clinical Experience with Terramycin in Treatment of Refractory Urinary Tract Infections

R. M. Nesbit and associates *(Journal of Urology*, 65:336, Feb. 1951) reports the use of terramycin in the treatment of 24 cases of urinary tract infection. In all these cases the infection was of long standing and had been resistant to treatment with other drugs and antibiotics. Terramycin hydrochloride was given in capsules; each capsule contained the equivalent of 250 mg. of pure terramycin base. The initial "loading" dose was 2.0 Gm., then 1.0 or 1.5 Gm. at six-hour intervals; in most cases treatment was continued for at least one week, except in 3 cases in which the patients refused to continue the treatment because of moderately severe nausea and vomiting. In 20 of the 24 patients, there was a satisfactory response to treatment and diminution of pyuria. In 10 cases, the urine cultures remained negative for a follow-up period of two weeks, but in 4 of these, reinfection with a different organism occurred later. In 10 cases, infection with the same bacteria recurred within one week after treatment was discontinued. In 4 cases there was no response to terramycin therapy. With the dosage employed, the concentration of terramycin in the serum varied from 1.66 to 16.5 micrograms per cc.; as a rule the highest serum concentrations were found in patients known to have reduced renal function. No "consistent correlation" was found between the concentration of terramycin in the serum, the sensitivity of the infecting organism and the result of treatment. White blood cell counts and hemoglobin determinations made daily during treatment showed no evidence of damage to the hematopoietic system. Bromsulfalein tests of liver function made before treatment and within forty-eight hours after treatment was stopped showed no evidence of liver damage. In 10 cases in which serial urea clearance tests of renal function were done, there was no significant alteration of renal function during treatment. Anorexia or mild nausea occurred frequently during terramycin therapy, but actual vomiting was of rare occurrence; treatment was discontinued on account of this in only 3 cases, as noted above. Loose bulky stools occurred frequently but severe diarrhea was noted in only one case. Dermatitis venenata was noted in one case on the sixth day of treatment; this patient had shown a similar reaction to other antibiotics and chemotherapeutic drugs. Terramycin is of value in the treatment of chronic urinary infections, because it will cure some patients "after all other anti-bacterials have failed." Its therapeutic activity in acute urinary in-

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fections was not evaluated in this study.

COMMENT

Nesbit and his associates have shown the clinical benefits to be derived in the treatment of the more resistant chronic types of urinary-tract infections. Their results, however, indicate that a relapse occurred in a considerable number as early as seven days after discontinuing the drug. Response to treatment appeared to have no relation to the serum concentration of the drug. Careful studies of kidney and liver function revealed no ill-effects of therapy. Repeated blood cell counts and hemoglobin also ruled out any harmful effects on the blood.

In my own experience, Terramycin appears to give better results in the more acute types of infection and is more effective than the other antibiotics.

While great progress has been made in the field of antibiotics, much remains to be accomplished in attaining the ideal of selectivity of a drug to destroy a given specific organism.

A.H.

The Use of the Smear of the Urinary Sediment in the Diagnosis and Management of Neoplasm of the Kidney and Bladder

J. H. Harrison and associates *(Surgery, Gynecology and Obstetrics,* 92:129, Feb. 1951) report the cytologic study of the smears of the urinary sediment in 614 patients, the majority of whom had had definite urinary symptoms. There were 67 patients with carcinoma of the bladder in this series, in all of whom neoplastic cells were demonstrated in the urine. In 15 patients with renal carcinoma no neoplastic cells were found in the urine in 3 instances ("false negative smears"). In 15 patients in whom neither vesical nor renal tumor could be demonstrated, neoplastic cells were found in the urine ("false positives"). These 15 patients have been followed for one to three years and have not shown any signs of neoplasm of the urinary tract. With modern urologic and roentgenographic methods, diagnosis of neoplasm of the urinary tract can be made with "a very high degree of accuracy." The cytologic study of the urinary sediment has been found of value as an aid in the diagnosis of tumors of the kidney and bladder in the authors' series and in cases reported by others. This use of this method may well lead to earlier diagnosis of these tumors, and thus more effective treatment. The method has also been found useful in the follow-up study of patients who have been operated on for tumor of the bladder; with the examination of the urinary smear made every two to four weeks in such cases, cystoscopy need not be done so frequently as was previously necessary for the detection of a recurrence.

COMMENT

The report of Harrison and his associates is of clinical interest and importance. They have confirmed the previous work of others in cytological urine-sediment study.

There is always one danger in this method. It is by on means rare to find 'false positive' reports; that is, the tumor cells in the urine where no neoplasm can be demonstrated. Harrison had 15 such cases, which were followed afterward for a period of 1 to 3 years.

While urographic and cystoscopic studies have been resonably accurate in the detection of urinary-tract tumors, earlier and more precise diagnosis may be provided in the finding of tumor cells.

A.H.

Lower Nephron Syndrome in Children

H. I. Riddell *(Journal of Urology,* 65: 513, April 1951) reports 2 cases of lower nephron nephrosis in children; in one, the syndrome followed a transfusion reaction, and in the other was due to a sulfonamide reaction. A review of the literature shows that cases of lower nephron syndrome in children have been reported by others, due to these same two factors, and also following severe burns and crushing injuries. Both the author's patients recovered under conservative treatment, the maintenance of fluid and electrolyte balance, and restriction of protein. The high mortality of lower nephron nephrosis in the past, the author attributes to the forcing of fluid in order to "dilute toxins" and promote diuresis, until patients were "literally drowned" in their own fluids. In the period of oliguria and

anuria, fluids should be restricted, rather than forced, but when diuresis is established fluids and electrolytes are given as indicated to prevent dehydration and hypochloremia. In children with no previous renal lesions, such measures as decapsulation and extrarenal dialysis are not indicated in the treatment of the lower nephron syndrome, unless conservative measures fail and anuria persists for ten to fourteen days.

COMMENT

While the possible severely harmful effects of sulfa therapy and transfusions on the kidney have been recognized for a long time, lower nephron nephrosis is a more newly-described lesion. The reviewer is not aware that this lesion is always present when damage is caused by sulfa, transfusions, burns or crushing injuries.

In combating oliguria and anuria great progress has been made in maintaining the electrolyte balance. Overzealous physicians must constantly be aware of the grave damage of overloading and 'water-logging' the patient by excessive use of oral and parenteral fluids.

In desperate cases, dialysis by using the mechanical artificial kidney may be the only means of saving the patient's life.

Careful supervision of urinary output and concentration in both adults and children, where the potential causal factors are present, may result in either preventing the condition, or in establishing successful treatment early.

A.H.

A New Chemical Approach to the Dissolution of Urinary Calculi

R. F. Gehres and S. Raywood *(Journal of Urology*, 65:474, March 1951) report the study of calsol (the sodium salt of ethyelenediaminetetra-acetic acid) as a reagent for the dissolution of urinary calculi. In *in vitro* studies, it was found that 35 stones obtained from 46 different patients were dissolved by 1 per cent calsol, and 43 were dissolved by 3 per cent calsol; in comparative studies with acid citrate G solution only 17 stones were dissolved. In animal experiments, the exposure of the bladder to calsol solutions for five or six hours had little or no toxic effect. The same solutions given orally to rats or mice also were well tolerated, but when given by mouth, calsol was recovered from the feces, not from the urine. Therefore, calsol cannot be effective in the dissolution of calculi of the urinary tract when given by mouth, but must be used for local irrigation. In further experiments on rabbits urate calculi were implanted in the bladder in 6 animals; in 4 the calculi were rapidly dissolved and in one "completely disintegrated" by bladder irrigation with calsol. In a preliminary clinical trial of calsol solution in 7 patients, it was found to be effective in 4 patients. For the best results a sodium calsol solution of 1.5 per cent, with pH 7.5, should be employed for tidal irrigation.

COMMENT

Despite the fact that numerous investigators have for many years tried to discover satisfactory solvents for urinary-tract calculi, none has been found. In recent years it was the hope of urologists that the Acid Citrate "Solution G" would solve the problem of dissolving bladder stones.

Calsol would seem to be a new advance, judging from the **in vitro** studies of Gehres and Raywood. However, it is a far cry from **in vitro** to **in vivo** results. Urate stones implanted in bladders of rabbits usually dissolved. Calculi of other composition may well be very resistant to the solvent. The authors claim success in four of seven patients, using a 1.5% solution and having a pH of 7.5 (by tidal irrigation). The drug cannot be used orally as none of it is excreted by the kidneys.

Those of broad experience will likely be skeptical until such time as wide use of the new agent may have proven the practical efficiency of it.

A.H.

Estimation of the Weight of the Hyperplastic Prostate from the Cysto-Ureterograph

R. C. Thumann, Jr. *(American Journal of Roentgenology and Radium Therapy*, 65:593-95, April 1951) describes a method for estimation of the weight of the hyperplastic prostate from the antero-posterior projection of the cysto-urethrogram. For making the cysto-urethrogram, the roentgen tube is centered over the pubis and adjusted to a distance of 36 inches from the cassette. The horizonal and vertical diameters of the prostatic

mass are measured on the cysto-urethrogram. For the horizontal diameter the distance between the lateral margins at the widest part of the prostatic mass is used. As hyperplasia of the prostate extends proximal to the verumontanum, the vertical diameter is measured from the verumontanum to the uppermost point of the prostate on the cysto-urethrogram. If the verumontanum is not shown clearly on the cysto-urethrogram, the external sphincter can be used as the distal point, and 1.5 cm. subtracted from the vertical measurement thus obtained. The average diameter is calculated from these measurements, and this is used for calculating the weight of the prostate; a "conversion table," showing the weight of the prostate for average diameters increasing progressively by .2 cm., has been prepared for this purpose as a matter of convenience; but this is not necessary as the weights in this table are calculated according to the formula radius cubed times 2 equals weight of prostate in grams ($R^3 \times 2 = W$). This formula, the author notes, was "discovered by accident," but it has been found to give satisfactorily accurate results. In over 100 cases in which the method has been used and the actual weight of the prostate determined after operation, it has been found that in prostatic adenomas weighing 25 Gm. or less, the estimated weight is within 4 Gm. of the actual weight; for adenomas weighing between 25 and 50 Gm., the estimated weight is correct within 8 Gm., and for those weighing over 50 Gm., within 10 Gm. In 2 illustrative cases reported, the estimated weight was 128 Gm., the actual weight 125 Gm. in one case; in the other the estimated weight was 49 Gm., the actual weight, 52 Gm. The estimation of the weight of the prostate is often of value in determining the method of prostatectomy to be employed.

COMMENT

This report, while rather ingenious and entertaining, is theoretical rather than practical in importance. It would seem incredible that the author could estimate by mathematical formula, with reasonable accuracy, the true weight of the hypertrophied prostate.

In a given case, it is very doubtful if the estimate would have any influence in guiding the urologist in the choice of operative procedure. Adequate removal of tissue in all cases, by precise methods, is the prerequisite to successful surgery. Measured radiographic shadows, therefore, are of more academic interest.

A.H.

PHYSICAL THERAPY

MADGE C. L. McGUINNESS, M.D.*
New York, N. Y.

The Refrigeration Treatment of Chronic Osteomyelitis

Robert Bingham *(California Medicine,* 74:108, Feb. 1951), reports the use of refrigeration with penicillin, and operation if necessary, in 9 cases of chronic osteomyelitis. For the refrigeration of small osteomyelitic lesions one or two ice caps are placed over a moist towel, which is applied to the skin. For larger lesions one or two layers of moist towelings are applied over the area, and crushed ice directly over the towel. The refrigeration is maintained until signs of local inflammation and infection have subsided. The

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temperatures that are tolerated without damage to the tissues are 57°F. for fingers and toes; 36 to 38°F. for the calf and upper extremities, and 32°F. for the femur; these are temperatures which retard the growth of bacteria. The ice is removed for an hour once or twice during the day in order to observe the extent of the infection and the condition of the circulation; if the skin over the lesion does not become warmer than the skin of the normal limb within an hour after removal of the ice pack, refrigeration is discontinued. In the cases reported, penicillin was also given by intramuscular injection and was continued for several days after all signs of infection had subsided. In 3 of the 9 cases reported, bed rest, refrigeration and penicillin resulted in complete cure. In the other 6 cases some surgical procedure was necessary two to five days after beginning treatment, usually unroofing of the abscess cavity or multiple drilling of the abscessed bone; after irrigation of the abscess cavity with penicillin, primary suture was done. Refrigeration and parenteral penicillin were continued after operation. In all cases the lesion healed without recurrence, all patients having been followed up for at least two years. Refrigeration was employed in these cases for four to eleven days, average seven days; the period of hospitalization did not exceed two weeks in any case.

COMMENT

Although there are only 9 cases in this series, the method of treatment points to hope for the future in a disease that in the past meant continuous recurrent, painful procedures and frequently a fatal result.

Surgeons long have known the beneficent action of refrigeration in purulent conditions, as shown in the packing in ice of the infected hand while the patient was being transported to an operative center. Refrigeration checks metabolism, inhibits bacterial growth, eases pain.

Applied early, operative measures may be not required or used to a slight degree. The longer the delay, the more interference will follow. Those of us who were formerly burdened with daily dressings, frequent incisions, often demanding anesthesia, will rejoice at the new order where only physical medicine and the antibiotics need be used.

M.C.L. McG.

Water As a Medium for Therapeutic Exercises

R. L. Bennett *(New York State Journal of Medicine*, 51:513, Feb. 15, 1951) emphasizes the fact that a therapeutic pool is not a swimming pool but is planned "to facilitate relaxation, mobilization and strengthening of bodily segments" in muscle re-education. The usual temperature of the water in the therapeutic pool is 88 to 90°F. At Warm Spring Foundation, Georgia, underwater tables and chairs are used in the therapeutic pool; for the therapeutic pool at Emory University Hospital, a special stainless steel underwater table has been designed. At Warm Springs the therapeutic pool is used for the treatment of the after-effects of poliomyelitis. At the Emory University Hospital, the pool is used in the treatment of poliomyelitis and also for a number of other conditions, including degenerative and rheumatoid arthritis and cerebral palsy. Probably the chief advantage of water as an exercise medium is its buoyancy and consistency, which make it possible to provide varying degrees of assistance or resistance to motion, as indicated. The temperature of the water also favors relaxation; water also gives the patient a "heightened feeling of motion," which is important in muscle re-education. Most patients enjoy treatment under water and have a desire to move about when in the water; this might result in over-activity, fatigue, and "faulty patterns" of movement if the patient is not under the care of a trained physical therapist. The therapist must be specially trained not only in muscle re-education procedures, but also in the use of water as a medium for such procedures.

COMMENT

To those physicians who have had a long and varied experience with patients suffering from

neuromuscular disorders, hydrotherapy justly holds a high place in the physical medicine field. Proper treatment presupposes an experienced, trained physical therapist who knows the dangers inherent in overtreatment and improper treatment. Families and friends are all too ready, in their desire to hasten recovery, to give the slow, repeated movements with frequent rests these conditions call for. **Festina lente** is needed today as when it was first advised.

Water the universal solvent, the best medium for applying temperature, relaxation and general rehabilitation in the shortest time, needs the greatest care in its use.

M.C.L. McG.

Significance to the Physiatrist of Recent Developments in Rheumatic Diseases

H. F. Polley and E. C. Elkins of the Mayo Clinic (*Archives of Physical Medicine*, 32:146 March 1951) discuss the relation of the recently developed use of cortisone and ACTH in rheumatoid arthritis to physical therapy in arthritis. The hormone treatment of rheumatoid arthritis has increased rather than diminished the importance of physical therapy. When cortisone and ACTH therapy result in relief of pain and muscular spasm and permit increased motion of the joints, then physical therapy can be used earlier and more effectively for muscle re-education to obtain the best possible recovery of function. If the rheumatoid arthritis has advanced until muscle atrophy occurs, the hormone therapy can control pain so that physical therapy can be employed not only to re-educate but also to strengthen the involved muscles. In the first series of patients treated with cortisone and ACTH, flexion deformities disappeared completely in more than two-thirds and were much improved in the others. In one of these patients who was most severely affected, the flexion deformity of the knees was relieved to some extent by cortisone; later when physical therapy was employed, there was still greater improvement and the patient eventually became ambulatory. In some patients with rheumatoid arthritis, undesirable physiological effects of cortisone or ACTH make it impossible to regulate the dosage so that the maximum therapeutic effect can be obtained; in such cases physical therapy is especially indicated. In the more advanced cases of rheumatoid arthritis in which irreversible articular destruction has occurred, the action of cortisone and ACTH is limited but these hormones do relieve pain. Thus some patients with rheumatoid arthritis who have been severely disabled and not considered to be "eligible" for physical therapy may have the advantage of this therapy. In these cases active exercises must be carried out gradually under the supervision of the physical therapist, and should be begun as soon as pain subsides and before weight bearing is permitted. In some cases orthopedic surgery may be indicated and in such cases, physical therapy is necessary for the best postoperative results. By the combination of hormone therapy and physical therapy (with surgery when indicated), persons incapacitated by rheumatoid arthritis may be rehabilitated.

COMMENT

The use of ACTH and Cortisone in rheumatoid arthritis has been a great step forward in treatment. Not only have these hormone agents proved themselves of use in relieving pain and spasm, but in so doing they permit the earlier and more effective use of physical medicine.

In certain cases, where these products were not available, the use of plasma from parturient patients in the hands of Granirer of Queens General Hospital caused remarkable improvement in severely afflicted women and continued treatment has proved the worth of the work. Physical medicine helped much more when pain and swelling had subsided and patients were enabled to continue employment with comfort.

This treatment can be stopped at will and results evaluated and the improvement continues. There is also no danger of the fearsome sequelae that have attended some cases where cortisone has been used. No infections, as hepatitis, thus far have been found. The cost is also within the limits of the patient's economic status as it may begin at zero, if necessary, and is regulated by the pocketbook vouched for by the referring clinician.

M.C.L. McG.

New Hydraulic Exercise Table

A. L. Watkins *(Archives of Physical Medicine,* 32:27, Jan. 1951) describes a new type of exercise table used in the Department of Physical Medicine of the Massachusetts General Hospital. The table, which is made of wood, has three movable sections, a back rest and two leg boards with adjustable straps. The movable sections are operated by a double-action hydraulic pump and three valves; this apparatus is so arranged that it can be operated by the patient; it has been found that this operation of the controls by the patient removes fear and appears to aid muscle relaxation. Heat, by diathermy or radiant heat lamp, can be employed during the muscle stretching exercises if indicated. The duration of the treatment is determined for each patient; fifteen to forty-five minutes are most commonly employed. This table has been found of value in patients with subacute low back strain, and pain on flexing the spine forward, but without evidence of nerve root irritation; in these cases stretching in the prone position with lowering of the head and foot boards and application of heat to the back are employed. This is followed by active exercises on the table placed in the "neutral position." In a few cases in which a ruptured disc has been suspected but operation did not seem to be indicated, the same treatment has been employed. In the convalescent stage of poliomyelitis, the same method may be used to increase back motion. The table has also been found of value for treatment of flexure contractures of the hip, if there is no contracture of the knee; in hip contractures in rheumatoid arthritis, stretching on alternate sides has been found to reduce muscle spasm and increase the range of extension. In all cases the stretching is done slowly and should not cause pain. If there is hamstring "tightness," either in the convalescent stage of poliomyelitis, or in association with mechanical back strain, gentle stretching may be done with the patient in the supine position by elevating the head and leg boards slowly to the limit of tolerance.

COMMENT

This is a most ingenious device calculated to interest the patient in treating himself under proper medical supervision. It is, therefore, to be duly commended for the good work done for the patient and as a saving for the physical therapist, physically and mentally. A conscientious technician can wear herself out trying to induce a patient to aid himself, by doing most of the work for him, the while she saves him from helping himself to recovery.

As other physical measures besides active exercise can be employed at the same session, the table is doubly valuable for the patient, in a number of conditions calling for rehabilitation.

M.C.L. McG.

Radar and Ultrasound in Therapy

Richard Kovacs* *(Annals of Western Medicine and Surgery* 5:199, March 1951) states that the microwaves used in physical medicine are the same as radar, except that for medical use a steady beam of energy is used, while for radar, "bursts" of pulsating energy are sent out and reflected. Microwave therapy is a form of diathermy; with the apparatus at present available, it is best used for effective heating of "circumscribed" areas without overheating adjacent areas; only one electrode is necessary. In the author's experience with microwave therapy he found no definite conditions in which it was superior to other methods of diathermy. The use of ultrasonic therapy has been developed to a greater extent in Europe than in the United States; the author tested various types of ultrasound equipment in his clinic and office, and found no evidence that better therapeutic results were obtained in most cases than would be obtained with other physical therapy methods. Further development of suitable apparatus and well-controlled clinical studies are, however, desirable.

**Dr. Kovacs died Dec. 29, 1950.*

COMMENT

Microwaves and radar are forms of heating that give spot treatment with one electrode, rather than diathermy which gives through-and-through heating with two electrodes. Thus far, except for the greater cost of these latest machines, there seems to be little difference in the two methods.

Ultrasonics is still in its infancy in this country as far as therapy is concerned. There is quite a dearth of the great volume of literature so common in European countries. American workers are proceeding slowly in their research work and in the development of machines. Thus far they feel the ordinary methods of physical treatment are preferable to or, as good, as the use of costly machines that have not yet been shown to encompass greater results in shorter time. Experience is building up.

M.C.L. McG.

OPHTHALMOLOGY

RALPH I. LLOYD, M.D., F.A.C.S.*
Brooklyn, N. Y.

Dendritic Keratitis and Sequelae

R. I. Lloyd *(Eye Digest,* April 1951, p. 14) describes a method of treating dendritic keratitis by the local application of carbolic acid in the earlier stages when the epithelium only is involved; this procedure does not damage Bowman's membrane. After the application of the carbolic acid and removal of the diseased epithelium, a local antiseptic and atropine are instilled and the eye is closed and bandaged. The eye is inspected daily, as in the first day or two, small "off-shoots" into the healthy epithelium may be observed, which can be treated with carbolic acid, as in the initial treatment. The eye must be kept closed and covered until it is white and painless, without redness or lachrymation. When the covering is removed and the eye is opened, it must still be protected until the sensitivity of the cornea is practically normal. Moist chamber spectacles made by opticians can be used for protecting the eye, but the author prefers to use the "expansion shield" for this purpose. After an attack of dendritic keratitis, even if treated promptly, the eye does not regain its normal resistance, and the ulceration is apt to recur. Patients should be warned of this danger and instructed in the use of the expansion shield if any symptoms of relapse develop. Protection of the eye with the expansion shield is also of value in other forms of keratitis, including disciform keratitis, keratitis bullosa and herpetic keratitis following removal of a foreign body.

Use of Cortisone in Disease of the Eye

F. S. Lavery and associates *(British Medical Journal,* 1:1285, June 9, 1951) report the treatment of 143 cases of diseases of the eye, including various types of keratitis, corneal ulcers and iridocyclitis. In most cases cortisone was given by subconjunctival injection or as drops instilled into the eye. This method of treatment is effective only in conditions that involve the anterior segment of the eye; parenteral administration is indicated if the posterior segment is involved. Local treatment was found especially beneficial in interstitial keratitis, and most cases of iridocyclitis also responded promptly. Treatment is most effective when given in the early stage of the ocular disease. As a number of the eye con-

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ditions in which cortisone is effective have an allergic basis, the use of cortisone to control the inflammatory reaction in the eye is recommended, while the basic cause is being investigated, as the cortisone therapy has no effect on "the underlying disease."

COMMENT

Cortisone is a valuable remedy but until its limitations are established and the particular field of its efficiency for which it is most valuable is known, the trial and error method is the only form of treatment. Each report of this type adds something to the general store of information and in due course each remedy of this type will be catalogued. R.I.L.

Ophthalmic Use of Terramycin

A. E. Town *(American Journal of Ophthalmology*, 34:723, May 1951) reports the use of terramycin in 132 cases of ocular infection of various types. Both an alkaline solution (0.5 per cent) and acid solution in methyl cellulose have been employed for local application; the methyl cellulose solution is as effective as the alkaline solution, is more stable and has better adhesive quality. In all cases local application of the terramycin solution was employed every two hours or oftener; if the ocular infection was associated with general disease, or if the deeper structures of the eye were involved, terramycin was also given by mouth. Treatment with terramycin was effective in 114 of the 132 cases, including staphylococcic and pneumococcic infections; good results were not as frequently obtained with viral as with bacterial infections but one of 2 cases of herpes responded promptly, and others have also reported favorable results in herpes zoster. The terramycin solution was no more irritating to the ocular tissues than other solutions "routinely employed," and there was only one case of sensitivity to the antibiotic noted in this series.

COMMENT

The various drugs of this group are of great value to the oculist but reports of the results of a drug should be specific in details. It is not enough to say that conjunctivitis was benefitted by a drug unless the type of conjunctivitis is specified. R.I.L.

Sulfhydryl Therapy in Ophthalmology, Progress Report

A. E. Cruthirds *(Annals of Western Medicine and Surgery*, 5:554, June 1951) reports that he has treated more than 1000 cases of burns of the eye with sulfhydryl (Hydrosulphosol®); in this series if treatment could be given promptly, no eye was lost unless it was practically destroyed by the injury. Even severe eye burns often healed in a few days, if sulfhydryl was applied promptly. These results have been confirmed by other ophthalmologists. Sulfhydryl is equally effective in chemical, thermal and ultraviolet burns; for best results it should be employed immediately after the injury; and this emergency treatment should be followed by continued sulfhydryl therapy. The importance of this in Civilian Defense is noted, especially in cases of atomic bombing. Sulfhydryl has also been successfully used in the treatment of old corneal scars; restoration of nearly normal vision has been obtained in many patients with thick corneal scars that had not responded to any other method of treatment. Cases of cataract have also been treated with sulfhydryl, but too recently to determine ultimate results; some patients have shown definite improvement; in others the growth of the cataract has been slowed; a long course of treatment with Hydrosulphosol® given by mouth, supplemented by topical applications of the drug, is indicated in cataract. Operation may be necessary in many cases but the sulfhydryl therapy can be employed to improve the eye condition before operation.

COMMENT

This drug has come into common use for traumas and burns of the eye. Its use for cataract is not common and it is difficult to see how one should expect this or any other drug to overcome what has always been an irreversible tissue change. R.I.L.

Rose Bengal Test in Diagnosis of Deficient Tear Formation

H. W. Forster, Jr. *(A. M. A. Archives of Ophthalmology,* 45.419, April 1951) notes that the rose bengal test for keratoconjunctivitis sicca or deficient tear formation is not frequently used in the United States. The rose bengal dye is used in a 1 per cent solution of isotonic sodium chloride or in 1:5000 benzalkonium chloride U.S.P. (Zephiran® chloride) and introduced into the conjunctival sac. Pontocaine® hydrochloride can be used for topical application if the dye causes too great irritation, and might be used as a routine in this test. In cases of defective tear formation, the rose bengal stains the bulbar conjunctiva and caruncle in the area between the lids, and occasionally the palpebral conjunctiva of the lower lid. If the cornea is involved, the corneal epithelial filaments are stained, but not Bowman's membrane. The rose bengal test was compared with the Schirmer test in 98 eyes; there was a good correlation between the two tests in which there was definite deficient tear formation; in the milder cases, however, the rose bengal test was positive in 20 eyes in which the Schirmer test was negative. There was no case in which the Schirmer test was positive and the rose bengal test was negative. In all the cases of mild keratoconjunctivitis sicca with positive rose bengal test, the symptoms were relieved by treatment with methyl cellulose drops or artificial tears; while this type of therapy relieves symptoms, it does not cure the underlying tear deficiency, as the rose bengal test remains positive. This test, the author finds, is of definite value in the diagnosis of the early and mild forms of keratoconjunctivities sicca, in which the diagnosis is often doubtful.

COMMENT

The commentator does not care for Zephiran in solutions of this type. Staining by rose bengal or fluorescein is limited to dead tissue like ulcers, epithelial shreds and the like. Whether keratitis sicca or the dystrophic cornea of Fuchs or that of post-herpetis lesions is due to too little tears is indeed a question. Behind this group of lesions is a trophic damage which causes edema of the cornea and blister formations or minute ulcerations and these will escape detection unless a stain of this type is used. These corneas require protection with some form of local antiseptic or some material that will adhere to the surface. Castor oil is the oldest of the remedies used but of late a number of cellulose solutions have come into vogue either as protecting solutions or vehicles.

R.I.L.

Aureomycin in the Treatment of Trachoma

Renald Ching *(A. M. A. Archives of Ophthalmology,* 45:657, June 1951) reports the treatment of cases of trachoma with aureomycin at the Tung Wah East Hospital, Hong Kong; these patients were hospitalized during treatment. In some cases both local instillations of an aureomycin ophthalmic solution and oral administration of aureomycin in capsules were employed, in another group, only local instillations, and in a third group only oral administration was employed. A small control group was treated by sulfacetimide locally, and another control group with penicillin locally. In all cases with an inflammatory condition of the eyes, aureomycin was promptly effective in clearing up corneal infiltration, ulcers and abscess with hypopyon and in relieving all symptoms associated with these inflammatory lesions. There was also a definite improvement in vision. While the local and the oral treatments with aureomycin were equally effective, the best results and the most rapid improvement were obtained with the combined local and oral therapy. Penicillin and sulfacetimide locally were also effective in clearing up inflammatory conditions, but did not act as rapidly as aureomycin. In cases of trachoma in which the eyes were "quiet," with no inflammatory symptoms, aureomycin had comparatively little effect, although gelatinous follicles and papillary hypertrophy showed slight regression and the pannus became thinner. It is possible

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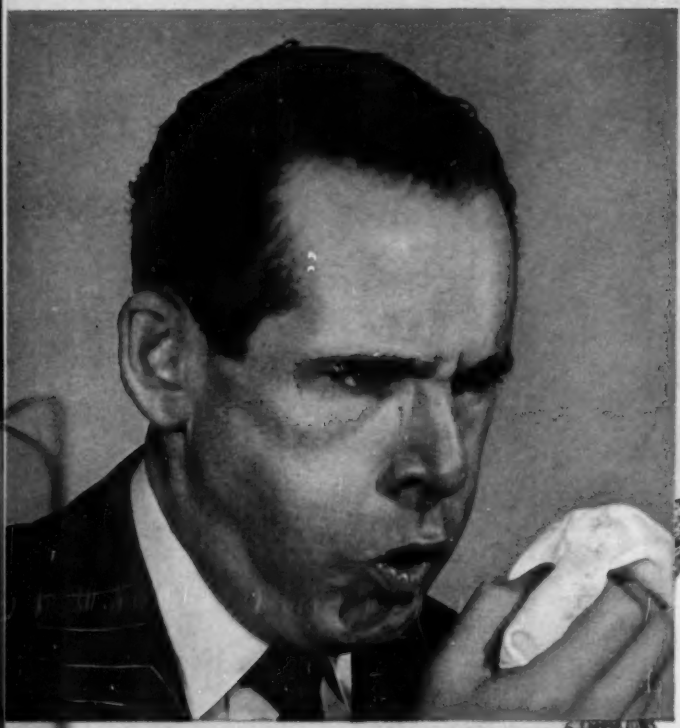

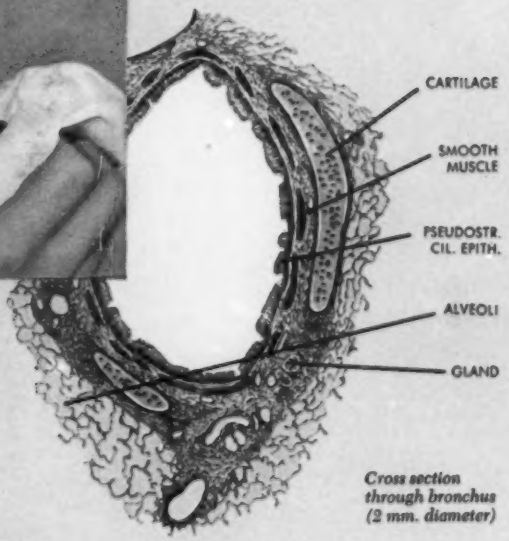

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1. Boyd, E. M. and Lapp, S.: J. Pharmacol. and Exper. Therap., 87:24, 1946. 2. Connell, W. F. et al.: Canad. M.A.J., 42:220, 1940. 3. Novelli, A. and Tainter, M. L.: J. Pharmacol., 77:324, 1943.

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that these persistent lesions do not represent active trachoma but scars of a previously active infection. However, in this series of cases, there was no definite evidence that aureomycin was active against the trachoma virus, although definitely effective against all types of secondary infections in trachomatous eyes. Further study and a longer period of observation are necessary to determine the true value of aureomycin in trachoma.

COMMENT

Trachoma is so unusual nowadays that a study of this kind brings to mind what a curse this disease was and how difficult it was to control it. Like phlyctenular conjunctivitis it is rarely seen and is easily brought under control by the antibiotics.

R.I.L.

Occupation Army, Dependents Receive Fine Medical Care

United States military personnel and their dependents in Europe are receiving excellent medical attention in a large, reconverted German hospital in Wiesbaden, Germany.

A report on this phase of German occupation was made by Dr. Elmer L. Henderson of Louisville, Ky., former president of the American Medical Association, in an article in *Today's Health*, published by the A. M. A. Dr. Henderson returned recently from visits to both European and Far East military hospitals.

"The Wiesbaden hospital provides medical aid and hospitalization for a sizable community of dependents of military personnel in addition to members of the Army, Air Force and Navy," Dr. Henderson said. "Besides those stationed in and around Wiesbaden, the hospital serves squadrons and camps all over Europe.

"The Military Air Transport Service handles the job of transporting the sick—soldiers and their dependents—from almost anywhere in Europe to Wiesbaden and back.

"One thing that impressed me at Wiesbaden, as well as in the Far East, was that none of the hospitals is overstaffed as they were during the last war," Dr. Henderson said. "I talked with many doctors in both theaters and all of them certainly feel that they are doing a worthwhile job. It was plain that the situation, so far as morale of medical personnel is concerned, was much improved over World War II.

"At the Wiesbaden hospital I talked with 1st Lt. Frank D. Howard, 26-year-old physician from Leesburg, Fla., who was called to active duty last January. Lt. Howard, who graduated from the University of Tennessee Medical School and took his training at Lloyd Nolan Hospital at Fairfield, Ala., arrived at Wiesbaden last February. Most of his work is in the field of urology.

" 'I have been pleasantly surprised with the type of assignment here,' Lt. Howard told me, adding that he felt the Air Force had been very thoughtful of 'my professional desires within the limits of medical activity possible, considering the ages in the service.'

"Another doctor, 1st Lt. Lloyd Storrs, 29, of Lubbock, Tex., who was called to active duty in December, 1950, told me he was happy with his assignment in otolaryngology.

" 'Since I came to Wiesbaden I have continued in my specialty,' Lt. Storrs said. 'The facilities and the patients represent a cross-section of the type of work I was doing at West Texas Clinic in Lubbock. I can honestly say that my entry into the service has not curtailed my opportunity of doing the type of work that I have chosen.' "

"...'Premarin' given in a cyclic fashion for several months may bring about striking adolescent changes..."* in the sexually undeveloped girl.

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*Hamblen, E. C.: North Carolina M. J. 7:533 (Oct.) 1946

MEDICAL BOOK NEWS

Roentgenology

A Text-Book of X-Ray Diagnosis. By British Authors. In Four Volumes. Edited by S. Cochrane Shanks, M.D. & Peter Kerley, M.D. 2nd Edition. Volume IV. Philadelphia, W. B. Saunders Co., [c. 1950]. 8vo. 592 pages, illustrated. Cloth, $15.00.

This work, by a group of distinguished English authors, is a most satisfactory and complete treatise dealing with the Roentgen study of the normal anomalies and abnormalities of the bones, joints and soft tissues. It comprises 573 pages and almost as many clear and well chosen illustrations. The text is excellently presented and concise—a most valuable reference to anyone engaged in the diagnosis or treatment of skeletal abnormalities.

RICHARD A. RENDICH

Physical Therapy

Importance du Thermalisme et du Climatisme en France. Opportunité et Nécessité d'un Crédit Thermal. By C. Paulin. Paris, L'Expansion Scientifique Française, [1950]. 8vo. 144 pages.

Among the resources which could contribute to the recovery of France are the health resorts making use of hot and mineral baths and the healthful effects of climate. In order to exploit these to the full the author argues for the establishment of a credit facility. He shows how these resorts act as an economic generator, stimulating many phases of the economy. The tourist trade, and especially that part related to health resorts, can be an important factor in restoring a favorable balance of trade for France.

Tuberculosis, rheumatism and syphilis are mentioned as diseases benefited by climate and hydrotherapy but no evidence is submitted to support these claims.

The author states that ill health comes to "workers forced to work in cities under a capitalistic system". The book obviously is propaganda material for the exploitation of health resorts and cannot be classed as a scientific treatise.

EDWIN P. MAYNARD, JR.

Obstetrics

Your Pregnancy. By Anne Roosevelt & Leo Doyle, M.D. New York, Henry Holt & Co., [c. 1950]. 8vo. 178 pages. Cloth, $2.50.

In seven, short, easy reading chapters, the authors of this handbook have presented the answers to the problems of the pregnant woman and her husband in concise and intelligent form. The emotional aspects of pregnancy are explained with frankness and candor, calculated to reassure the patient that pregnancy is not a disease, but rather an ennobling natural experience. The stressing of this point makes the volume unique in its class. Controversial entities are discussed without confusing the reader. Including an appended glossary of common obstetrical terms, the authors have achieved completeness and orderliness in offering the pregnant woman a practical and most valuable guide throughout her entire gestation.

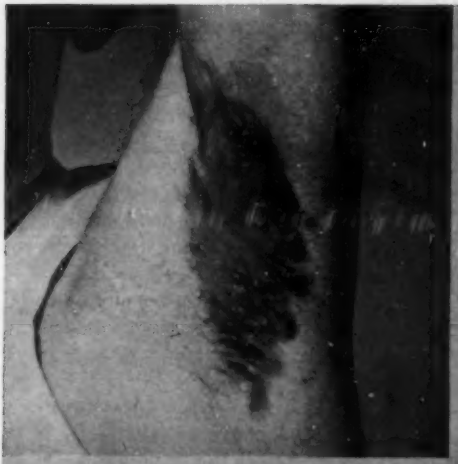
ALFRED A. SCHENONE

—Concluded on page 736

Highly effective in an unusually wide range of common skin disorders

Pragmatar

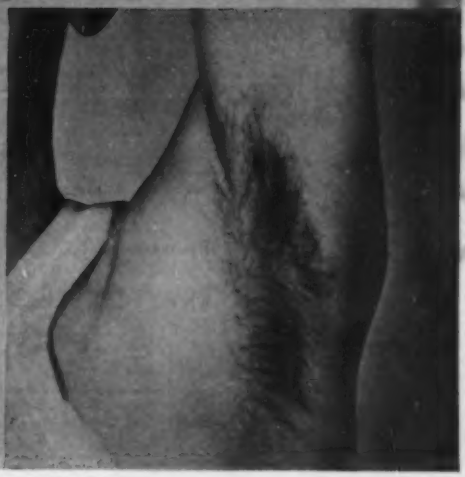
the outstanding tar-sulfur-salicylic acid ointment



In seborrheic dermatitis

Pruritic axillary seborrheic dermatitis of 6 years standing, April 5, 1951. Treatment over the years with various medicaments had failed.

At termination of therapy with Pragmatar, May 24, 1951. (*From the first day of treatment the itching had stopped. By the end of one week there was a marked clinical improvement in the lesion.*)



Formula: Cetyl alcohol-coal tar distillate, 4%; near-colloidal sulfur, 3%; salicylic acid, 3%—incorporated in a special washable base.

'Pragmatar' T.M. Reg. U.S. Pat. Off.

Smith, Kline & French Laboratories, Philadelphia

MEDICAL BOOK NEWS

—Concluded from page 734

Amusing Quotations

Amusing Quotations for Doctors and Patients. Edited by Noah D. Fabricant, M.D. New York, Grune & Stratton, [c. 1950]. 12mo. 149 pages. Cloth, $3.00.

Dr. Fabricant has collected a delightful selection of sometimes wise and always amusing quotations. Ideal for the desk of a man with a taste for but not the time for good reading. A welcome addition to the lighter part of anyone's library.

JEROME WEISS

Diabetes

A Primer for Diabetic Patients. An Outline of Treatment for Diabetes with Diet and Insulin Including Directions and Charts for the Use of Physicians in Planning Diet Prescriptions. By Russell M. Wilder, M.D. 9th Edition. Philadelphia, W. B. Saunders Co., [c. 1950]. 16mo. 200 pages, illustrated. Cloth, $2.25.

Dr. Wilder's small manual has now gone into its ninth edition, thus attesting to the place it has made for itself in the literature for patients.

Diets are more liberalized and insulin treated patients are informed that moderate glycosuria is compatible with good therapy.

The author has a tendency to treat of principles of therapy too often. It is questionable whether this is desirable, especially when thoughts are expressed which may be at variance with accepted procedures. For example, the author indicates that he never advises the use of more than 20 units of protamine zinc insulin in the more severe diabetics, but proceeds to insulin mixtures. Here again he does not exceed 20 units of protamine insulin. It seems to the reviewer that a manual for the patients best serves its purpose if it deals with techniques of therapy rather than principles.

The section dealing with food facts and menus is very good. The book is clearly written.

WILLIAM S. COLLENS

Wyeth

YOUR DIABETIC PATIENT
and
FAULTY LIPID METABOLISM

• The Problem

It has long been recognized that many diabetics have a defective mechanism for metabolizing fats, especially if they are overweight and middle aged.[1]

• Two-Sided Etiologic Picture

Liver disease is generally secondary to diabetes . . . but sometimes liver dysfunction may aggravate the diabetic syndrome.[1]

• Value of Lipotropic Therapy

In the former case, lipotropic factors such as choline[2] and inositol[3] have been observed to reduce excessive blood cholesterol levels.

In the latter case, the patient's response to lipotropic therapy may so favorably influence the syndrome that insulin requirements are sharply reduced.[1,4]

• In Every Case . . .

The cardinal rule of lipotropic therapy is to give enough, long enough.

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- To give enough—because WYCHOL is potent. One tablespoonful supplies 3 Gm. choline *base* plus 0.45 Gm. inositol.
- To maintain therapy—because WYCHOL has an appealing fruit-like flavor.
  (It should be noted that each tablespoonful Syrup WYCHOL supplies 6.75 Gm. sucrose)

1. Leevy, C.M., Ryan, C.M., and Fineberg, J.C.: Am. J. Med. *8*:290, 1950.
2. Pomeranze, J., and Levine, V.: Rev. Gastroenterol. *16*:771, 1949.
3. Feich, W.C., and Dotti, L.B.: Proc. Soc. Exper. Biol. & Med. *72*:376, 1949.
4. Dietrich, H.W.: South. M. J. *43*:743, 1950.

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MODERN THERAPEUTICS

Postpartum Plasma in Rheumatoid Arthritis

Pooled Postpartum plasma was administered intravenously in doses of 250 cc. once a week to 8 patients with severe rheumatoid arthritis. A gradual and sustained remission of symptoms occurred with the first improvement usually evident between the 4th and 6th treatment. Upon cessation of therapy a return of symptoms required from 6 weeks to 12 months. In general the return of symptoms was slow and they did not reach the former degree of severity. Resumption of therapy with postpartum plasma was always effective when there was a recurrence of symptoms. The patients experienced an improved sense of well-being, a better appetite, increased vigor, strength, and amelioration of joint pain and swelling. Associated with the clinical improvement there was a return to normal of the serum albumin, globulin, and hemoglobin but, there was no relationship between the sedimentation rate and the clinical improvement.

Granirer concluded in *J.A.M.A.* [*146:* 995 (July 14, 1951)] that, although this series was small and further study will be necessary, it would appear that pooled postpartum plasma is an effective therapeutic agent for the treatment of rheumatoid arthritis. Administration of the plasma over a prolonged period of time was well tolerated; unlike ACTH or cortisone, plasma had no side effects; the results obtained, on the whole were as dramatic as those recorded for ACTH or cortisone; and a supply is readily available at a relatively low cost.

Procaine Penicillin Blood Levels With and Without Benemid

The oral administration of 0.5 Gm. of Benemid (*p*-dipropylsulfamylbenzoic acid) every 6 hours for 24 hours before the oral administration of procaine penicillin increased the average maximum blood levels from approximately 0.5 to 1.3 units per cc. Varying results were obtained with this dosage but it was found that a dose of 1 Gm. every 6 hours produced consistent increase in the penicillin blood levels. Walker and Hunter reported, in *Lancet* [*261*:104 (July 21, 1951)], that no nausea or vomiting was produced by Benemid. Some patients took the drug continuously for up to 42 days without evidence of renal damage.

Antagonism of Sulfadiazine to Penicillin

In vitro studies with *Klebsiella pneumoniae* showed that sulfadiazine interferes with the bactericidal action of penicillin at the time of maximum sulfadiazine action, 6 to 10 hours of incubation. No interference occurred with concentrations of penicillin so rapidly bactericidal that no organisms survived beyond 6 hours. However, it was pointed out by Gunnison *et al.* in *Antibiotics & Chemotherapy* [*1*:259 (July 1951)] that it was found that the two agents together were more apt to kill all exposed bacteria, eventually, but at a slower rate than penicillin alone.

There was no interference with the therapeutic effect of penicillin in mice infected with *Staphylococcus pyogenes* when sulfadiazine was administered concurrently or up to 2 hours before the penicillin. However, there was marked antagonism when sulfadiazine was given 5 to 7 hours prior to penicillin. Penicillin alone cured 95 to 100 per cent of the animals but only 20 to 40 per cent survived when both drugs were given under the latter conditions.

—Continued on page 72a

abolishing pain

restoring useful function

promoting optimal well-being

The DARTHRONOL systemic rehabilitation program has been specifically designed to accomplish these benefits even in advanced stages of arthritis—where many patients consider themselves incurable.

The DARTHRONOL formula combines the antiarthritic action of adequate dosage of vitamin D with balanced proportions of 8 other vitamins which facilitate beneficial response in the treatment of chronic arthritis by correcting systemic disturbances and promoting metabolic efficiency.

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Each Capsule Contains:

Vitamin D	50,000 USP Units
Vitamin A	5,000 USP Units
Vitamin C	75 mg.
Vitamin B_1	3 mg.
Vitamin B_2	2 mg.
Vitamin B_6	0.3 mg.
Niacinamide	15 mg.
Calcium Pantothenate	1 mg.
Mixed Tocopherols (Type IV)	4 mg.

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MODERN THERAPEUTICS

—Continued from page 70a

Synergism of Phenolic Compounds with Sulfanilamide In Vitro

Kayser, Besson and Pouchol reported on the effects on *Escherichia coli* in vitro of various phenolic compounds alone and in combination with sulfanilamide. Writing in *Compt. rend. Soc. biol.* [*145*: 423 (March 1951)] through *Squibb Abst. Bull.* [*24*:651 (July 18, 1951)] the authors stated that a combination of 0.02 per cent sulfanilamide and 0.01 per cent hydroquinone stopped growth for nearly 5 days but that when growth began again it equaled the growth of the controls within 24 hours.

The combination of 0.02 to 0.5 per cent resorcinol and 0.01 to 0.013 per cent sulfanilamide produced greater but less prolonged bacteriostasis than either alone. However, when 0.02 per cent sulfanilamide was used in this combination the effect of the sulfanilamide was partially reversed. When 0.01 to 0.02 per cent sulfanilamide and 0.01 to 0.03 per cent phloroglucinol was combined bacteriostasis was evident for at least 30 hours as compared with 9 hours for either alone. However, 0.005 per cent phloroglucinol reversed the effect of 0.02 per cent sulfanilamide. Also, the inhibitory effect of 0.025 or 0.05 per cent sulfanilamide was reversed by the addition of 0.02 per cent pyrogallol although the combination of 0.01 to 0.02 per cent sulfanilamide with 0.005 to 0.05 per cent pyrogallol was more bacteriostatic than either alone.

Antihistaminics and Burns

Antistine (2-(N-benzylanilinomethyl)-2-imidazoline) was given orally every 6 hours for 18 hours in doses of 100 mg. to patients with burns and scalds. When therapy was started not later than 4 hours after injury there was relief or disappearance of pain within a few hours,

absence of blistering or sepsis and a return of the burned areas to normal within one week. Milne and Balfour also stated in *Brit. Med. J.* [2: 117 (July 14, 1951)] that pain decreased or disappeared, the serious discharge dried up entirely within 24 hours, and the drying and healing times were shortened even in those patients in whom blistering had already occurred before treatment was begun.

Antibiotics in the Treatment of Protozoan Diseases

Bacitracin, in doses of 60,000 units per day, was given to 22 patients with *Endamoeba histolytica* infection for 5 days and to 3 patients for 10 days. Eighteen were cured and were followed for an average of 5 months. Mild side effects were observed, notably, gastro-intestinal disturbances and transitory skin eruptions. Shookhoff, writing in *Bull. N. Y. Acad. Med.* [27:439 (July 1951)], also reported the use of aureomycin in doses of about 1 Gm. a day in 24 patients. Benefit was obtained by 22 of the patients who were followed for an average of 4½ months. The side effects were more distressing than those observed with Bacitracin and consisted principally of nausea, diarrhea, and anal irritation varying from mild itching to severe inflammation. Among 6 patients given 4 to 8 Gm. of terramycin over a period of 4 to 5 days, 2 receiving 4 Gm. showed *E. histolytica* in the stools after treatment. Re-treatment with 6 Gm. produced negative stools in 1 of these patients. Side effects included anal irritation, diarrhea, and abdominal distress.

Benefit was obtained by 3 of 5 patients with amebic hepatitis who were given aureomycin. One patient with hepatitis who was given Bacitracin showed negative stools but no alleviation of symptoms. All of the hepatitis cases not benefited were cured with chloroquine.

—Continued on following page

MODERN THERAPEUTICS

—Continued from preceding page

Intravenous Chloramphenicol

The commercially available 25 per cent solution of chloramphenicol in 50 per cent aqueous N, N-dimethylacetamide can be administered intravenously, according to Schimmel *et al.* in *J. Phila. Gen. Hosp.* [2:41 (1951)]. The authors found that the rapid injection of as much as 4 cc. of the undiluted preparation produced no fall in blood pressure in human subjects. Some patients complained of pain along the injected vein and of an extremely bitter taste but there were no serious side effects in 25 patients given as much as 12 cc. A comparison of the administration of 0.5 and 1 Gm. by oral and intravenous routes showed that the biological activity was the same and that plasma concentrations were comparable except for the initially high level following intravenous administration.

Sulfonamides in Acute Tonsillitis

Eighty-two consecutive cases of acute tonsillitis were divided into two equal parts in a random fashion. The patients were treated with strict bed rest, 30 gr. potassium citrate every 4 hours, liberal fluids, and usual symptomatic treatment. In addition, one half of the patients received 0.5 Gm. tablets of sulfatriad every 4 hours, except during the night, until 50 tablets were taken. The other half received lactose tablets that were identical in appearance, on the same dosage schedule.

Writing in *Brit. Med. J.* [No. 4702:323 (1951)], MacDonald and Watson stated that they found no difference in the rate of recovery between the two groups. However, the medical officer in charge was able to detect a difference in the patients as to their general appearance and as to whether the cure was good or poor. Good

—Continued on page 76a

PERSEVERANCE *with* RIASOL SUCCEEDS IN PSORIASIS

'Tis a lesson you should heed,
Try, try, try again.
If at first you don't succeed,
Try, try, try again.

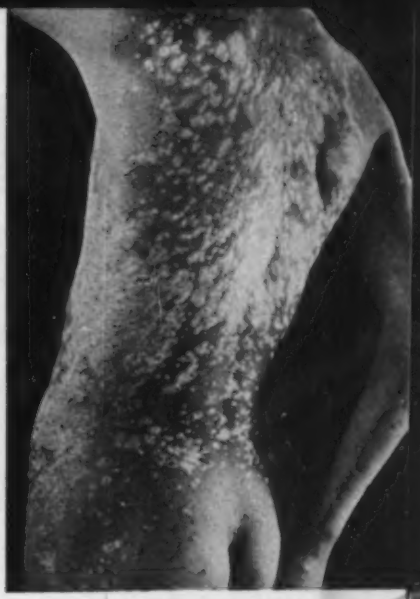
When other therapies fail in psoriasis, try RIASOL. Perseverance with RIASOL succeeds in the great majority of cases. A clinical test with RIASOL showed 76% of successful results in a series of cases which had failed to respond to other methods.

Perseverance with RIASOL is necessary to insure lasting success. The treatment should be continued until the last patch has been cleared away. If even a few small areas are left untreated, there is always the danger of a recurrence.

RIASOL contains 0.45% mercury chemically combined with soaps, 0.5% phenol and 0.75% cresol in a washable, non-staining, odorless vehicle.

Apply daily after a mild soap bath and thorough drying. A thin, invisible, economical film suffices. No bandages required. After one week, adjust to patient's progress.

Ethically promoted RIASOL is supplied in 4 and 8 fld. oz. bottles, at pharmacies or direct.



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RIASOL for PSORIASIS

—Continued from page 74a

appearance of the patient and good cures were significantly associated to a higher degree with the use of the sulfonamide combination. However, the authors concluded that the routine administration of sulfonamides to patients with acute tonsillitis is not warranted on the basis of the results obtained in this study.

Use of Dromoran Hydrobromide For Preoperative Medication

Dromoran, a new, synthetic, morphine-like analgesic, was used for preoperative medication in 986 adults and 514 children. The drug was given subcutaneously with atropine sulfate or scopolamine 60 to 90 minutes before the induction of anesthesia. Patients scheduled for emergency procedures received the premedication intravenously.

Drs. V. K. Stoelting, R. A. Theye, and J. P. Graf reported in *Anesthesiology* [*12*:225-229 (March, 1951)] that results with 1500 cases were gratifying. Dromoran was satisfactory for preoperative medication in 1402 patients. According to the authors, "these patients were mentally at ease and without pain or anxiety before induction of anesthesia. They appeared drowsy but responded readily to all questions and commands. Euphoria was not evident. Patients who received the drug did not complain of any unusual sensations or nausea or vomiting. Periods of hallucinations and disorientation were not observed. There were no complications attributable to the premedication in this group, either during the induction and maintenance of anesthesia or in the postoperative period. No untoward effects were noted in any of the patients receiving the drug intravenously."

Most of the unsatisfactory results with

—Continued on page 78a

In coronary artery disease...

BALANCE cholesterol - phospholipid

with **B-TROPIC**

LIPOTROPIC-OXYTROPIC THERAPY

"It is hypothesized that the levels of serum cholesterol and serum phospholipids are less important in coronary artery disease than is the ratio of cholesterol and phospholipids."[1]

"...the lipotropic agent choline was effective in significantly reducing the mortality rate due to acute coronary thrombosis...in...115 patients with proved coronary atherosclerosis."[2]

The new metabolic concept of atherosclerosis emphasizes the importance of correcting the impaired metabolism of both fat and oxygen in this disease.[3,4,5] B-TROPIC* stimulates phospholipid turnover—helping to bring about a normal cholesterol-phospholipid balance—and enhances the body's oxidative efficiency.

Other Indications: Hepatic cirrhosis, diabetic hypercholesterolemia and liver dysfunction, and other disorders of fat metabolism.

2 Agreeable, Sugar-Free Dosage Forms

B-TROPIC SOLUTION Each Tablespoonful contains:		B-TROPIC CAPSULES Each capsule contains:	
Choline Citrate (47% choline base)	6 Gm.	Choline Dihydrogen Citrate	375 mg.
Inositol	2 Gm.	Inositol	125 mg.
Thiamine Hydrochloride	5 mg.	Thiamine Hydrochloride	1 mg.
Riboflavin	2 mg.	Riboflavin	0.5 mg.
Nicotinic Acid	20 mg.	Nicotinic Acid	5 mg.
In a flavored, sugar-free vehicle			

1. Dexter, M. M.; et al.: Circulation 2: 317 (1950). 2. Morrison, L. M.: Ann. West. Med. & Surg. 4: 585 (1950). 3. Hopper, W. C.: M. Clin. North America 32: 773 (1948).

SUPPLIED: B-TROPIC Solution—bottles containing 1 pt. and 1 gal. B-TROPIC Capsules—bottles containing 100, 500, and 1,000.

*Trademark of The Vale Chemical Co., Inc.

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—Continued from page 76a

Dromoran in 98 patients were due to errors in dosage or the time of administration. The authors state that "this is not surprising in view of the fact that to the best of our knowledge this is the first report on the use of dromoran hydrobromide for preoperative medication."

Treatment of the Menopause Symptoms with Androgen-Estrogen

In a study using 4 tablets identical in appearance Glass and Shapiro found that a combination of estrogen and androgen was more effective in treating the symptoms of the menopause than either the androgen or the estrogen separately. One tablet contained 0.25 mg. diethylstilbestrol, another 5 mg. methyl testosterone, another 0.25 mg. and 5 mg., respectively, and a fourth was a placebo. The tablets were used on the patients in various sequence with the placebo used between to eliminate lag effect and verification was established by retrial. None of the clinical investigators knew the contents of the tablets except the placebo.

Writing in *GP* [3:39 (1951)] the authors stated that the range of dosage for saturation during the first 14 to 21 days was 5 to 10 mg. methyl testosterone and 0.5 to 1.0 mg. diethylstilbestrol. During maintenance the daily dosage ranged from 2.5 to 5.0 mg. methyl testosterone and 0.25 to 0.5 mg. diethylstilbestrol. They found that subjective data such as relief from flushes, sweats, nervousness, palpitation, and arthralgias was more sensitive as an indication of improvement than the objective finding of changes in vaginal cytology.

The authors found that 72.8 per cent of the 92 patients studied preferred the

—Continued on page 80a

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(soluble bead form)

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Contains all the amino acids, and only amino acids, in correct ratio to maintain nitrogen balance. Needs no digestion. Ready for immediate absorption.

Tastes bland, slightly bouillon. Can be taken in large or small amounts of liquids, hot or cold water, soups, tomato or vegetable juices.

Complete solubility allows massive dosage. 1 tablespoonful (approximately 5 grams) of Stuart Amino Acids is soluble in 1 ounce of water or other liquids. Ideal for tube feeding.

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The Stuart Formula is one of the oldest ethical multivitamin products in the nation, yet constant improvements to meet the latest medical demands have kept it one of the finest ethical multivitamin products available...compare.
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The Stuart Formula is a complete maintenance multivitamin, containing a complete B complex, including natural factors and B12. Two Stuart Formula tablets also provide adult maintenance amounts of iron and iodine plus trace minerals.
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HOSPITAL STAFF AND OFFICE MANUAL

by T. M. Larkowski, Professor of Clinical Surgery, Stritch School of Medicine, Loyola University, Chicago, Ill., and A. R. Rosanova, Clinical Instructor, University of Illinois Medical School, Chicago, Ill.*

*Deceased

† "If one has ever had the experience of being a naive substitute intern tossed into the maw of a busy medical ward and confronted with terrifying orders to perform hypodermoclyses, spinal taps, and bewildering laboratory procedures, he will regret that this valuable little manual was previously unavailable.

"Tersely restricted to essentials and amply illustrated, it scans routine hospital techniques, laboratory procedures, electrocardiography, and radiography. It also outlines the specialized examination of the various anatomic systems. It can be recommended as an excellent handbook for the senior medical student, intern, and practitioner as a reminder of the essentials of medical practice."—**Journal of the American Medical Association**

A "Complete" Medical Refresher At Your Fingertips In 1 Pocket-Size Edition

This essential manual, with its 22 chapters, 428 pages and 150 illustrations contains the result-producing procedures of the authors and their sixteen capable associates. Here are the time-tested, trustworthy basic principles of the clinical practice of medicine and surgery in all its branches.

The text of this manual is a novel departure in that it is short at times to the point of abruptness. This factor, however, is inherent in the design of the manual as the authors have purposely omitted the highly theoretical and concentrated instead on compacting all the essential and practical information possible into this one handy manual.

- **Fabrikoid, semi-flexible cover, resistant to water, acid, mildew.**
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Other Reviews

"HOSPITAL STAFF AND OFFICE MANUAL is authoritative and usable. It should find a welcome in any hospital's library or doctor's reference shelf." HOSPITAL MANAGEMENT

"By far the best arranged and most readily usable of any of the pocket manuals." OHIO STATE MEDICAL JOURNAL

"Presents the time-tested, the trustworthy, the basic principles of the clinical practice of medicine and surgery in all its branches." FLORIDA MEDICAL JOURNAL

"The purpose of the book is to bridge the theoretical teachings in medical school and the actual practice of medicine in the hospital and office. The publishers have succeeded in this." NEW YORK PHYSICIAN

"It is a good source of quick reminders on most of the problems with which a physician may find himself faced. The conception and execution . . . reflect great credit upon the organizing ability of the authors." MEDICAL TIMES

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—Continued from page 78a

combined therapy. The improved comfort to the patient, the inherent simplicity, and the clinical responses to this combined therapy were so gratifying that they now recommend such treatment in the management of the menopausal syndrome.

Nisentil for Obstetrical Analgesia

Nisentil, a new, synthetic narcotic was used for obstetrical analgesia in 1,000 patients during labor. LaForge, writing in the *New York State Journal of Medicine* [*51*:835 (August 1, 1951)], reports that "Nisentil is an improvement over any analgesic drug heretofore available, and, while it does not make labor a painless process, it alleviates pain to an extent greater than that obtained with any drugs we have previously used in obstetrics."

Doses of 40 to 80 mg. of Nisentil, depending upon the mother's weight, were administered subcutaneously. Hyoscine in doses of 1/200 to 1/150 gr. was used as adjuvant to increase somnolence and amnesia.

The analgesic effect of Nisentil was rapid, beginning usually within five minutes and persisting for about two hours. Patients questioned two or three days postpartum were generally enthusiastic over the pain relief during labor.

Twelve women complained of slight dizziness, one of disorientation, another of urticaria and a third of lightheadedness.

In the infants, respiration was spontaneous in 80%, slightly depressed in 18%, and moderately to markedly depressed in 2%.

Collagen Diseases Treated with Cinchoninic Acid Derivative

A cinchoninic acid derivative, 3-hydroxy-2-phenylcinchoninic acid, was given orally to 4 patients with rheumatic fever, 2 with polyarteritis nodosa, 3 with scleroderma, and to 3 with lupus erythematosus. Doses of 20 mg. per Kg. of

body weight were given daily for seven days in seven cases and for 2 to 3 weeks in the others.

Rennie, Milne, and Sommerville reported in *Brit. Med. J.* [*No. 4703*:383 (Feb. 24, 1951)] that all 4 of the patients with rheumatic fever showed rapid improvement. Although 2 relapsed a second course gave relief from fever and joint pains. One of the patients with polyarteritis nodosa and all 3 of the patients with scleroderma showed improvement. However, 2 of the latter relapsed. The authors were particularly pleased with the improvement in the scleroderma cases since most therapeutic agents are so ineffective against this condition. Little improvement was noted in the patients with lupus erythematosus.

The only side effects were vomiting in 3 and diarrhea in 4 but these effects were not sufficiently severe to require withdrawal of therapy.

Synthetic Anti-Malarials in the Treatment of Malaria

A group of 245 African school children with an average age of 7.6 years and naturally infected with malaria, mostly *Plasmodium falciparum*, were given a single dose of 0.3 Gm. chlorguanide, 0.3 Gm. quinacrine, or 0.3 Gm. chloroquine (0.5 Gm. of the diphosphate); or they were given total doses of 2.5 Gm. chlorguanide in 5 days, 1.4 Gm. quinacrine in 5 days, or 0.75 Gm. chloroquine (1.25 Gm. of the diphosphate) in 3 days. Some of the children were left untreated as controls.

Bruce-Chwatt reported in *Trans. Roy. Soc. Trop. Med. Hyg.* [*44*:563 (1951)] that the children were observed for more than 2 months and that none of the drugs had any significant effect on the spleen rate or on the average spleen index in single doses. However, the spleen rate was reduced by half by the end of treatment in those receiving the regimens.

—Continued on following page

MODERN THERAPEUTICS

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The response was most marked in the chloroquine and quinacrine groups and was slower in the chlorguanide group. Resistance of the parasites to treatment was most evident in the chlorguanide group and not evident in the chloroquine group. The presumed relapse rate of *P. falciparum* infections 2 months after chlorguanide treatment was 25 per cent higher than after quinacrine or chloroquine.

Vitamin K in Bacillary Dysentery

The oral administration of vitamin K in doses of 10 mg. every two hours for two days resulted in cures in all of the patients in the series on the first day of treatment. The rate of cure was an improvement over treatment with vitamin K by intramuscular injection, which had no effect on the disease, and over oral administration of vitamin K combined with bile salts, which resulted in cures in three days. Krause suggested in *Hospital, Rio de Janeiro* [*39*:361 (Mar. 1951)] through *J.A.M.A.* [*146*:1079 (July 14, 1951)] that (1) vitamin K kills *Shigella dysenteriae* or (2) bacilli of the coli group lose the capacity of producing vitamin K and that this loss results in decreased resistance of the host to *S. dysenteriae* or increased virulence of the organism.

Use of Bacitracin in Dermatology

Superficial pyodermas in 75 patients were treated topically with a petrolatum base ointment containing 500 units of Bacitracin per Gm. or with wet dressings of a solution containing 500 units of the antibiotic per cc. Forty-six of the patients were completely cured and 27 were improved within a period of 3 days to 3 weeks. Other skin diseases healed with this topical therapy, according to Fin-

nerty in *New England J. Med.* [*245*:14 (July 5, 1951)], were a deep ischiorectal abscess, recurrent boils, an ulcer of the buttock, secondary infection associated with psoriasis, and secondary infections associated with varicose or traumatic ulcers. The author also stated that highly resistant acrodermatitis continue and impetigo rodens yielded to this treatment.

Salicylazosulfapyridine in Rheumatoid Arthritis

Thirty patients with rheumatoid arthritis were treated with salicylazosulfapyridine for a period of 2 months to one year. Fourteen of these patients showed a relief of symptoms. Seven of those improved had not been improved previously by gold therapy and four had had toxic reactions to gold. Fourteen patients experienced no relief of symptoms but their condition did not become worse. Only one patient showed an extension of disease to joints not formerly involved, during the course of treatment. These results were different than those obtained by British workers in 20 patients with rheumatoid arthritis for the latter reported no benefit. Kuzell and Gardner, writing in *California Med.* [*15*: 476 (1950)], stated that their results may have been better because they employed a smaller dosage over a longer period of time.

Toxicity studies on rats and mice showed minimal changes, notably in body weight and in leucocyte count.

The fact that gold preparations and the sulfonamides have a similar but lesser effect than the hormones currently in use in rheumatoid arthritis warrants further study of these compounds, according to the authors.

NEWS AND NOTES

Korean Wounded Has Better Chance Than Victim of Civilian Accident

A wounded member of the United Nations in Korea entering a military hospital has a better chance of survival than a civilian accident victim who is taken to a large municipal hospital.

This is the opinion of Major General Edgar Erskine Hume, chief medical officer of the United Nations Forces in Korea.

Writing in a recent issue of the *Journal of the American Medical Association*, General Hume said deaths among hospitalized service men in Korea have run at about half of the record low rate in World War II. In that war, about 955 out of every 1,000 men brought to a military hospital lived, whereas the Korean survival rate has risen to 975, he said.

"Municipal hospitals in large cities, those that care for the victims of ordinary accidents due to traffic, industry and the like, can hardly match these figures," he added.

"One must see the smoothness with which this united medical service functions to believe it possible," General Hume said. "We make no distinction in our hospitals as to the nationality, race, rank or religion of our patients. They are separated solely on the basis of their clinical condition. Not once has there been any difficulty or complaint regarding this policy. No physician, civil or military, can be other than satisfied to see a gen-

—Continued on page 86a

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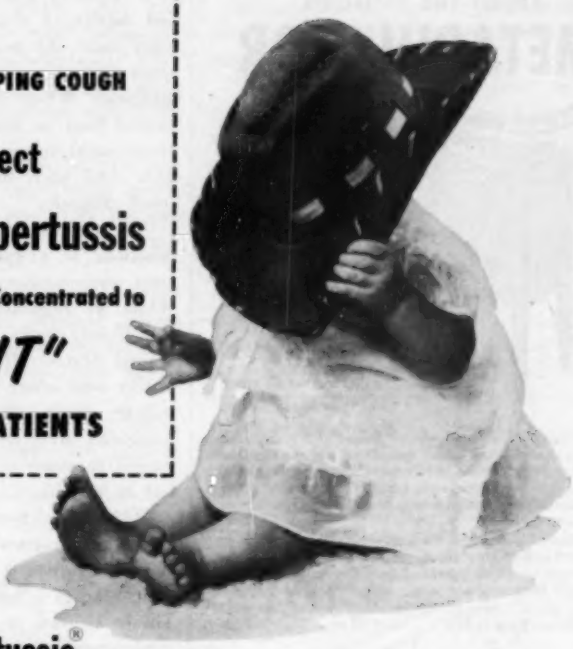

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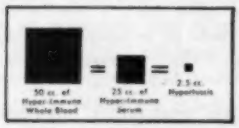

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INSIST ON 2.5cc Hypertussis · CUTTER

"A Thimbleful of Dosage for a Handful of Baby"

NEWS AND NOTES

—Continued from page 84a

eral in the bed next to a private, a Frenchman beside a Filipino, or a Negro in a bed adjoining that of a man of some other race. We hold that nowhere is the spirit animating the United Nations more manifest. When requested, we provide special food for those whose dietary rules or national usage specifies a particular diet. And even this has caused us but small difficulty.

"The manner in which our blood bank functions is a splendid example of the good consequences of good cooperation. While we regularly receive the bulk of our blood stocks by airplane from the United States, all and sundry people in Tokyo and other Japanese centers contribute their blood generously. The American Red Cross has effectively attended to much of the administrative detail in all this.

"There have been many military medical advances growing out of our experience in Korea. We have found that the helicopter is a wondrous saver of lives. These aircraft are attached to mobile army surgical hospitals, our most forward hospital units, in which women nurses are on duty. Upon call from the aid stations in the area of actual combat, the helicopter is sent forthwith to bring back the wounded man. Thus, in a matter of minutes rather than hours the patient is brought into a hospital where he may receive operative care. I have repeatedly decorated men in a hospital within one hour from the moment they were wounded.

"Other air evacuation methods have likewise been developed to a new high point of efficiency. Small airplanes transport patients to airfields where they can be placed upon larger craft. Agonizing rides over the terrible roads, cut to pieces by artillery and by heavy use, are thereby avoided, though there are tactical situ-

ations when no other transportation can be employed. We use large motor ambulances, accommodating a dozen or more patients. Some of these ambulances have auxiliary metal wheels which can be lowered so that the vehicle may run on railway tracks. We have splendidly equipped hospital trains with every modern facility that carry patients from point to point in Korea where such mode of travel is indicated.

"Never before has there been a war in which the wounded could be so speedily and effectively removed from the embattled country and taken to a land not at war."

General Hume said that while other nations have sent small medical groups along with their contingents, the medical service is dependent largely upon American personnel.

He also reported that disease, which once killed more soldiers than bullets, has been checked among the United Nations forces. This is not the situation among the enemy soldiers where a heavy death toll has been attributed to epidemics.

He said one of the few good features of this campaign is the opportunity for medical research, adding:

"Studies which in times of peace would require years may be completed in a matter of months, such being the tempo of the conflict. Much is quickly learned in clinical practice, also, in the fierce light of battle. All this is of great importance to youthful physicians drawn into the military service from peacetime professional pursuits of civil life. They have a wealth of clinical material and unrivaled opportunity to learn, and so when they return to their hospitals and other functions at home they will find themselves better qualified."

—Continued on following page

NEWS AND NOTES

—Continued from preceding page

New, Potent Curare Antagonist

A new, potent curare antagonist which acts within one-half to one minute—Tensilon Chloride 'Roche'—has recently been announced by Hoffmann-La Roche Inc. Tensilon is useful whenever a curare antagonist is needed either to terminate the action of curare when no longer required or to counteract overdosage. It is particularly valuable in abdominal and pelvic surgery, in endoscopy, in shock therapy, in patients whose muscle spasm is treated with curare, and in other conditions in which curare is used. Tensilon is also a potent antagonist for d-tubocurarine, Flaxedil and dimethyl-tubocurarine (Metubine or Mecostrin). It is, however, ineffective against Syncurine and Mytolon. Administered by intravenous injection in 10-mg (1-cc) doses, Tensilon is available in 10-cc multiple-dose vials, 10 mg per cc. Chemically, Tensilon Chloride is (3-hydroxy-phenyl) dimethylethyl ammonium chloride.

Report Two Cases of Medical Rarity—Rupture of Infant's Stomach

Two cases of a rarity in medical history —the rupture of the stomach of a newborn—were reported in a recent issue of the *Journal of the American Medical Association.*

With only 20 instances to be found in medical literature, two cases were treated in the Trull Hospital, Biddeford, Me., within a space of less than three months. Surgery saved the life of one baby, but the other died.

The cases were announced by Drs. Maurice Ross, Paul Stanley Hill, Jr., and Carl M. Haas of Saco, Me., all on the staff of the hospital.

The first was a boy, born February 17, 1950, after a normal pregnancy and un-

complicated delivery. Four days later, the child's abdomen became distended so that it was "as tight as a drum." An x-ray revealed a large amount of gas in the peritoneal cavity. Puncture with a 20-gage needle released large amounts of gas under increased pressure. Respiration improved but despite further treatment, the infant died that day. An autopsy disclosed a stomach perforation.

On May 6, 1950, twins—a boy and a girl—were born in the hospital. The boy was sluggish immediately after delivery, but soon appeared to be well. Normal findings were reported two days later. On the third day, a distended abdomen developed. An x-ray presented a picture similar to that seen in the earlier case. Surgery resulted in the release of air under pressure and revealed a rupture of the stomach wall. The child withstood the operation well and was released from the hospital on June 5. When examined on March 3, 1951, "he was in excellent health," the report said.

"The second case is of special interest because the patient had a congenital defect in the musculature of his stomach and, as a careful search of the literature has not revealed any reports of survival from this condition, is believed to be the first one reported to have survived rupture of the stomach in the neonatal period." the doctors said.

Indiscriminate Use of Aspirin May Affect Blood

Serious effects may result from the indiscriminate use of such salicylates as aspirin, according to a report in a recent issue of the *Journal of the A.M.A.*

—Concluded on following page

NEWS AND NOTES

—Concluded from preceding page

The case of a 74-year-old man who experienced eight years of continuous intestinal bleeding as the result of prolonged use of aspirin was reported by Drs. Walter Modell and Russel Patterson of the department of pharmacology and surgery, Cornell University Medical College, New York.

"Serious toxic reactions to the salicylates are rare in relation to the widespread use of this group of drugs," the report stated. "In the present case it was possible to establish a causal relationship between prolonged intestinal bleeding and the taking of acetylsalicylic acid."

The patient, according to the report, suffered from weakness, anemia and a decrease in the number of colorless blood corpuscles which are believed to aid in the clotting of the blood.

The symptoms disappeared with the discontinuance of the use of aspirin. However, the doctors pointed out, they were unable to determine positively the connection between the taking of the aspirin and the reduction of the number of colorless blood corpuscles.

Grants to Chicago Medical School

The Chicago Medical School has received research grants totaling $18,000.

Eli Lilly has granted $6,000 for diabetes research. The program will be under the direction of Dr. Piero P. Foa.

The Chicago Heart Association gave grants of $2,000 and $6,800 for work to be carried out under the direction of Dr. Aldo A. Luisada, and $4,000 for research to be directed by Dr. George J. Scheff.

Doctor's Orchestra Reorganized

The Brooklyn Doctors' Symphony Orchestra has recently been reorganized. Rehearsals will be held on Wednesday evenings at 8:30 P.M. at Brooklyn State Hospital.

All members of the medical, dental and allied professions are cordially invited.

CLASSIFIED ADVERTISEMENTS

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LABORATORY technician and receptionist wanted. New Rochelle, New York. Box 10A100, Medical Times.

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TWO NURSES wanted—general duty—18 bed hospital (Dr. Porter's Hospital, Glenwood Springs, Colorado).

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REGISTERED LAB. and x-ray technician wanted. Must be good. Forty-four hour week, plus split call duty. Salary (no maintenance)—$300 per month; with other qualifications—up to $400 per month. Write, Langdon Clinic and Hospital, 2236 Bessemer Road, 5 Points West, Birmingham, Ala.

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HOUSE, OFFICE, fully equipped with x-ray and Hamilton furniture. Twelve years established practice. Will sell equipment. Leaving to specialize. Will not return to office. Florida. Box 11R36, Medical Times.

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HOSPITAL, OFFICE, equipment and home in good farming community in South Texas. Leaving for health reasons. No other doctor in community. Box 11E23, Medical Times.

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Beautiful handmade and painted jars, imported from Germany. Wide assortment of styles and sizes. Rich colors. Ideal for office decorations, lamp bases, as vases, for mantel pieces, as gifts, etc. Limited supply, so order now. For complete details write—Box 11W, Medical Times.

MEDICAL TIMES, NOVEMBER, 1951

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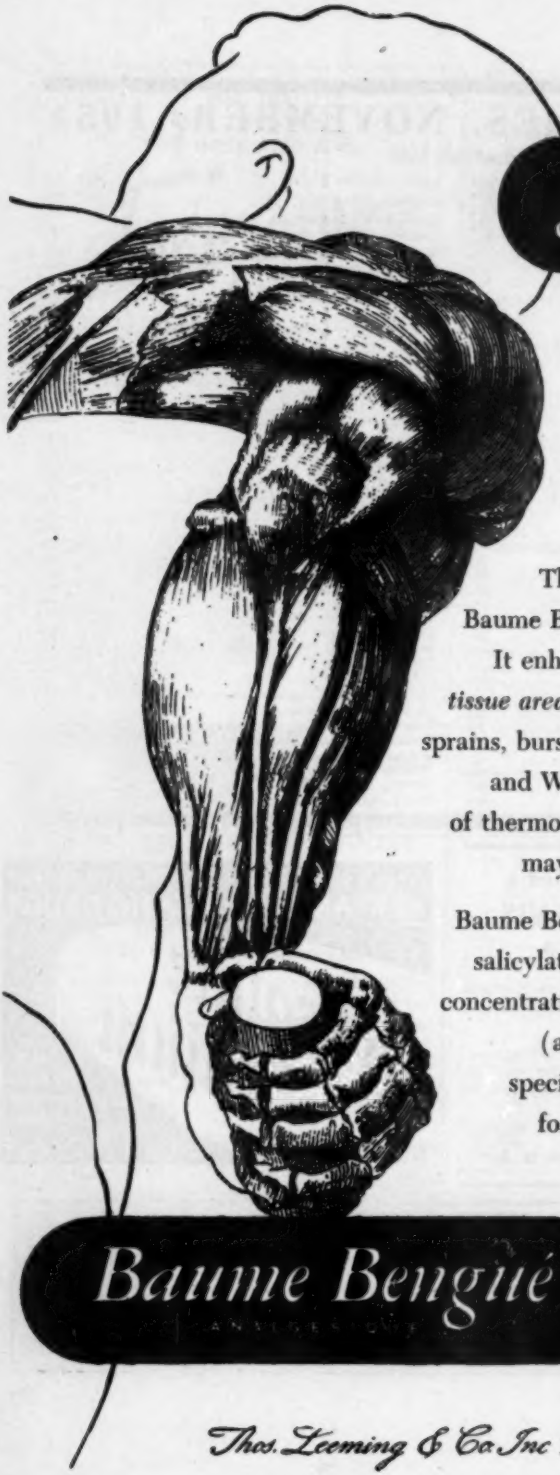

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ANALGESIC

1. Lange, K., and Weiner, D.: J. Invest. Dermat. *12*:263 (May) 1949.

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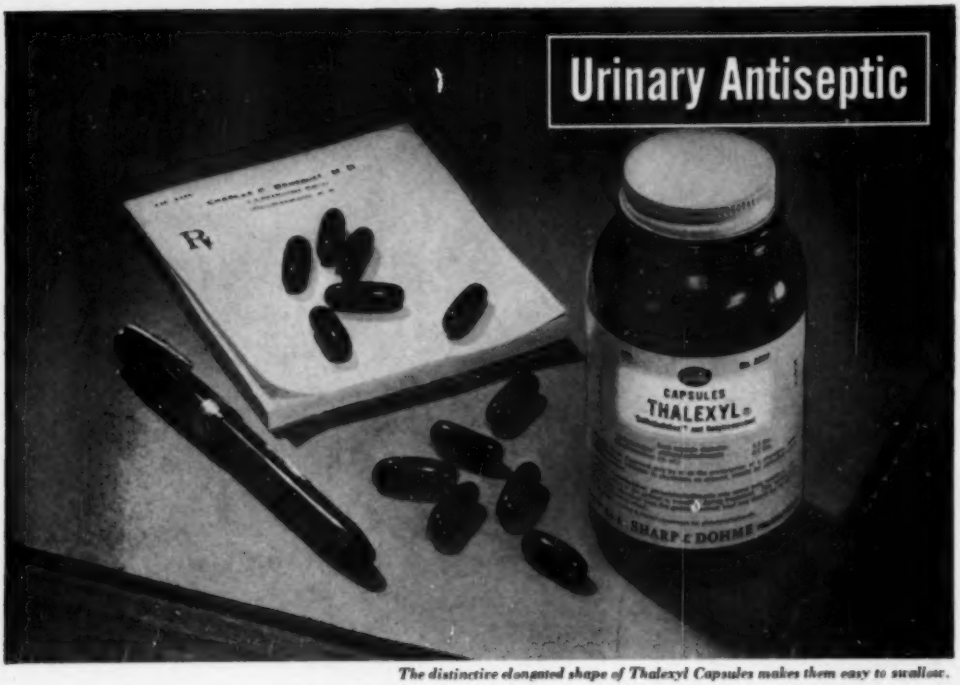

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Symptoms are usually brought under control promptly: Pain, burning, and tenesmus are relieved. Especially gratifying is the release from the frequent urge to urinate which, before treatment, is sometimes so troublesome as to wake patients several times during the night.

THALEXYL is effective against *Escherichia coli* and various cocci. It usually renders urine sterile within one week, but medication should be continued for a total of three weeks to ensure against recurrence of infection.

Recommended dose for adults: 4 capsules three times a day (total daily dose of Sulfathalidine: 6.0 Gm.; of hexylresorcinol: 1.2 Gm.).

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Capsules should be taken after each meal to avoid the possibility of gastric irritation; they should be swallowed whole with water. Fluid intake should be restricted, and diuretics should be avoided during treatment. Sharp & Dohme, Philadelphia 1, Pa.

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Capsules Sulfathalidine® and Hexylresorcinol